Peter Liander

J35F1 of F18 Wing

Aerofax Minigraph 12

Saab J35 *Draken*

by Robert F. Dorr, René Francillon and Jay Miller

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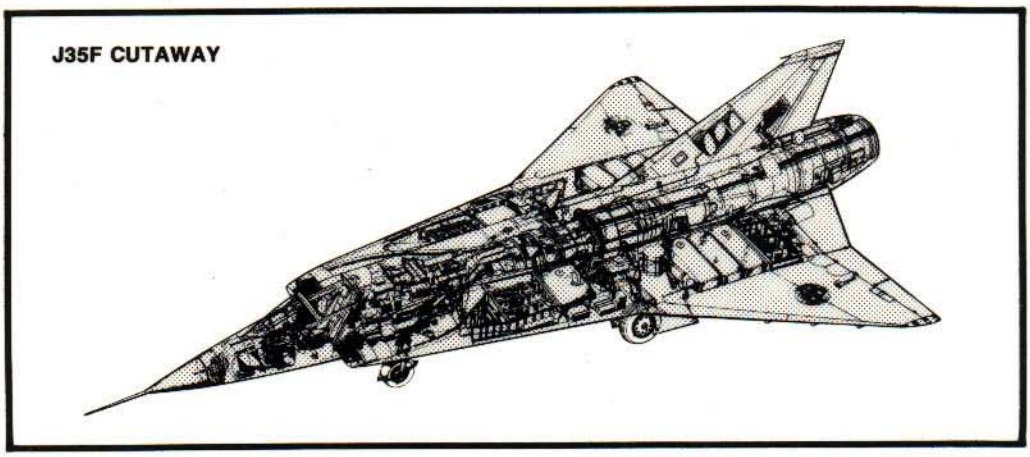

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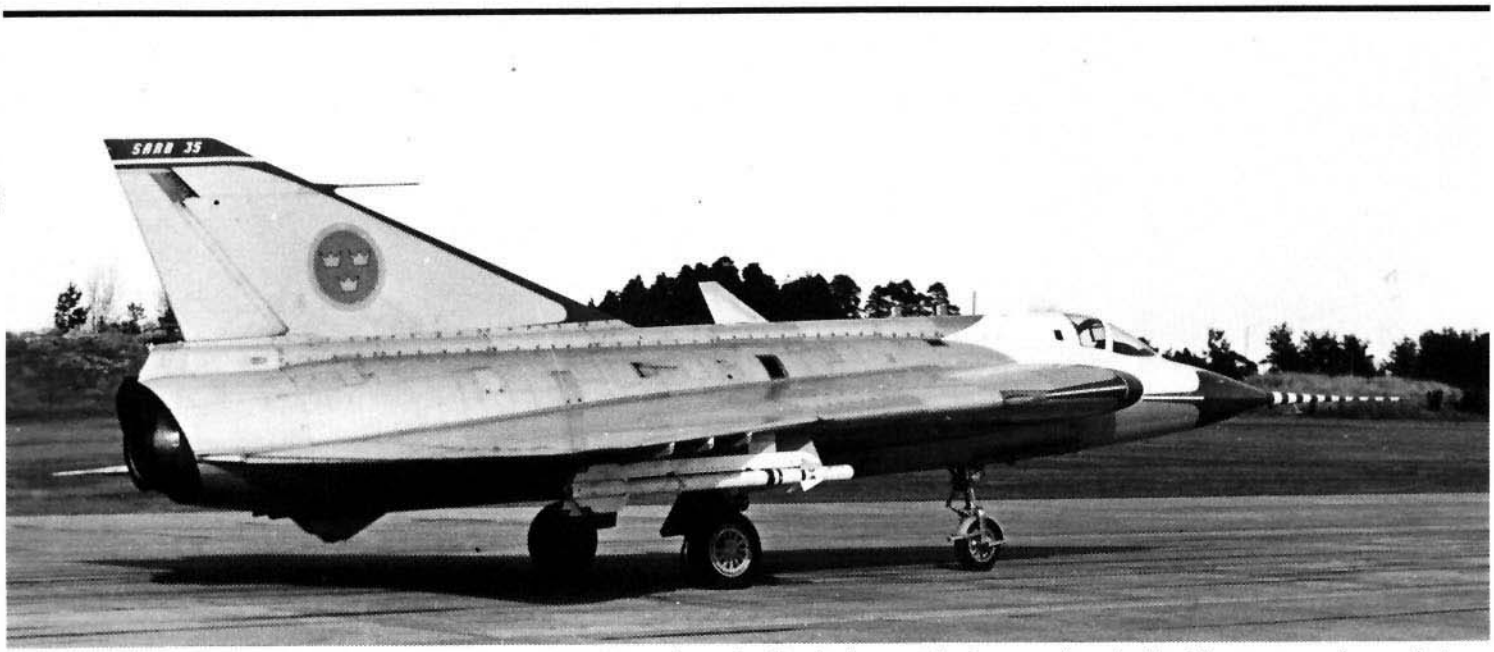
THE SAAB 35 *DRAKEN* STORY

Göran Henriksson via SAAB



The prototype J35, 35-1, shortly after its October 25, 1955 first flight. Noteworthy are the abbreviated over-rotation bumper on the underside of the empennage, the very short and angled empennage fairing around the two-position afterburner exhaust nozzle, and the conservative canopy and windscreen transparencies. This aircraft, like several of the early SAAB 35s, was equipped with a lengthy pitot boom and several dorsally-mounted data link and communications antenna.

CREDITS:

The authors and **Aerofax, Inc.** are indebted to *SAAB-Scania AB* and the *Flygvapen* for the assistance they provided during the preparation of this **Minigraph**. Moreover, this work would have been impossible to complete without the extraordinarily generous help of Göran Henriksson. His enthusiasm and sustained support for this project gently propelled it forward through a maze of informational and photographic difficulties. Others whose contributions should be acknowledged include Bengt Andersson, David Anderton, Paul Auerswald, Rolf Berggren of Volvo Flygmotor AB, Lennart Berns, Roy Braybrook, Robert Downey, Peter Foster, Bill Gunston, Alan Hall, Martin Judge, Bjorn Karlsson, Michael King, Peter Liander, Robert Lofberg, Carol McKenzie, Col. Gosta Norrbohm, Anders Nylen, Hans Percy, Chris Pocock (special thanks), one "Deep Throat", and Barry Wheeler.

PROGRAM HISTORY:

When information concerning the successful accomplishment of the world's first supersonic flight (October 14, 1947, Bell X-1, 46-062) reached Sweden during late 1947, a small engineering team in the *Svenska Aeroplan Aktiebolaget* (SAAB) engineering department suddenly was given incentive to approach a proposed new fighter project from a somewhat different perspective. With confirmation in hand that supersonic flight was possible, SAAB's small but extraordinarily capable design bureau intended that whatever aircraft they produced to accommodate their country's defensive needs from the 1950s onward, it would become an early beneficiary of the X-1's unique technological triumph.

Sweden's indigenous aircraft industry, which centered around the SAAB concern (with origins dating back to 1930, it was founded as a separate company during 1937; in 1978 it was merged with *Scania-Vabis*, another Swedish firm which like SAAB, was a major producer of automotive products, and the resulting company was named *SAAB-Scania Aktiebolaget*) was barely a decade old in 1947. In reality, SAAB had come into its own during the pre-dawn silence of April 9, 1940, when Gen. Otto Englebrecht's 163rd *Wehrmact* Infantry Division, in one of many Nazi *Blitzkreig* assaults at the beginning of WWII, seized Oslo Airport. This event, coupled with the fact that President Franklin D. Roosevelt embargoed US warplane shipments to Sweden the very next day, suddenly awakened this small European nation to the fact that its stance of armed neutrality was no guarantee of isolation in a world awash with war.

Oslo became, in retrospect, Sweden's Pearl Harbor. Coupled with the Roosevelt decision less than twenty-four hours later, its loss (and the associated loss of scarce flyable hardware) suddenly had placed the country in a virtually indefensible position. In less than a day, half of its 120 Seversky EP-106 fighters and all of its Vultee Model 48C fighters had been removed from its inventory.

The Oslo Airport lesson did not go unheeded, however, and within weeks of the loss, the *Kungliga Svenska Flygvapen* (Royal Swedish Air Force—the Royal prefix was dropped during 1974; the service usually is referred to as *Flygvapnet*) was meeting in its Air Staff buildings off Valhallvagen generating plans for an indigenous aircraft industry; never again would it be dependent upon external sources for its combat hardware.

By the end of WWII, the *Flygvapen*, working with its privately controlled manufacturer, SAAB, had designed, built, and produced the versatile J21 fighter/attack aircraft (it later became the only major fighter ever employed operationally in both propeller-driven and jet-powered versions). While modestly successful in its multi-faceted role, the J21 quickly was outmoded by the designs generated by other western bureaus. Acutely aware of this, SAAB, far from resting on its laurels, proffered and had accepted by the *Flygvapen* a more advanced fighter program that quickly evolved into hardware in the form of the J29 *Tunnan* (Barrel) fighter. The J29, which took to the air for the first time on September 1, 1948, proved a worthy successor to the rather crude J21. Eventually no less than 661 of these rotund, but highly effective aircraft entered the *Flygvapen* inventory, serving operationally during the 1950s and into the early years of the 1960s.

The *Tunnan* was, in turn, followed by an even more successful SAAB fighter, the A32 *Lansen* (Lance), of which some 452 were built. The *Lansen* saw nearly two decades of *Flygvapen* service before slowly being phased out, and though modestly underpowered, nevertheless was a competitive aircraft when flown one-on-one with its 1950s contemporaries.

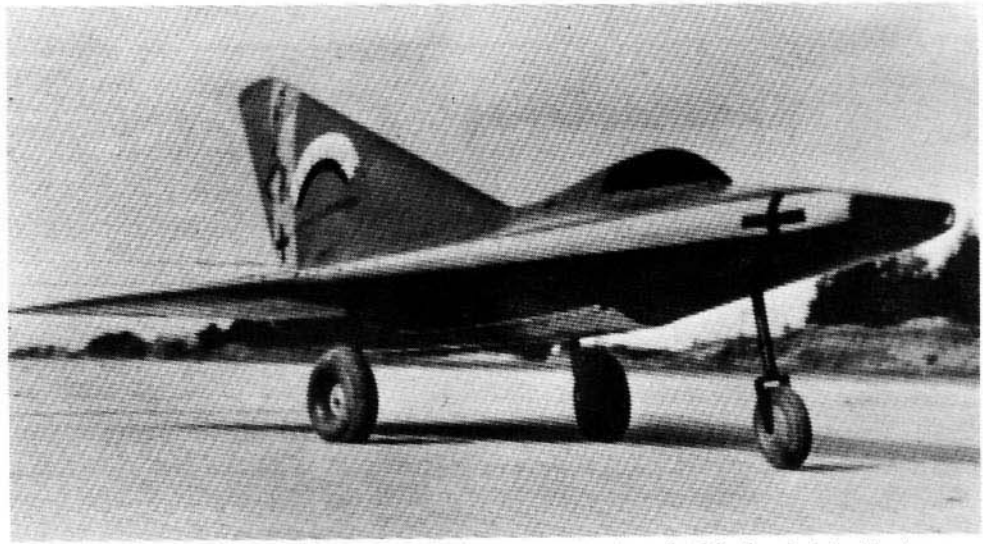
Over the years since circumstances forced it, SAAB, in the central Swedish backwater of Linköping had

SAAB

The ground-level J35 final assembly line of the SAAB-Scania Aerospace Group at Linköping, Sweden, includes J35Fs for the Swedish Air Force, and F35s, RF35s, and TF35s for the Danish Air Force. Visible in the left background is the parallel production line for the J37 "Viggen". Also being manufactured are SAAB 105s.

SAAB

Scale models of the basic double delta configuration were flight tested using a U-control flight control system attached to an articulated center post.



SAAB

A number of different scale models were built, each powered by a single small 4.5 lb. th. pulse-jet and having an average wingspan of approximately 3 feet. The model shown had an unusual and very pronounced flattening of the intake, this configuration contributing to the forward surface area of the double delta wing.

nurtured, by 1949, a fighter design team second to none. Lars Brising, the team manager and a noted aerodynamicist in his own right, was the prime mover behind the forthcoming *Lansen* project. Eric Bratt, just 33 years old in 1949, was the principal designer and consequently, the man charged with the configuration studies that would accommodate Sweden's future fighter needs.

Planning commenced during 1949 on the aircraft that would supersede the J29 and later, the A32. The requirements, as set forth by the Air Staff, included the ability of the aircraft to intercept transonic enemy bombers (which, as Sweden's intelligence service accurately predicted, already were well down the road to reality). In response to this, the initial *Flygvapen* advanced fighter requirement called for a maximum speed of Mach 1.4 to 1.5 (in 1956 this was increased to Mach 1.7 to 1.8). Specificaly, the fighter was to be able to climb to "A" altitude at subsonic speed ("A" + 2 km in 1956) and to an altitude of 32,800 ft. (10 km) in "T" seconds ("T"/2 in 1956). High supersonic speeds, high rates of climb, and very high maximum altitude capabilities all were intertwined with a demanding specification defining combat maneuverability. These performance requirements were, in turn, coupled with an armament complement that would include guided missiles, rockets, and cannon. In concert with these weapons a radar and associated fire control system would be developed permitting target contact and assistance without accurate ground guidance. Missile firing also would be possible without the use of the aircraft's optical gunsight.

Added to these requirements was a need for an exceptional range performance to ensure an ability to change bases of operation without difficulty and upon short notice. Additionally, good airfield performance was stated to included the ability to operate from runways only 2,000 m/6,560 ft. long and 13 m/42 ft. 8 in. wide—thus making the aircraft capable of operation from virtually any straight section of conventional highway. As it were, there were over 400 sections of Swedish highway that met this specification, and areas with highways under construction almost always consulted the *Flygvapen* before formulating firm plans.

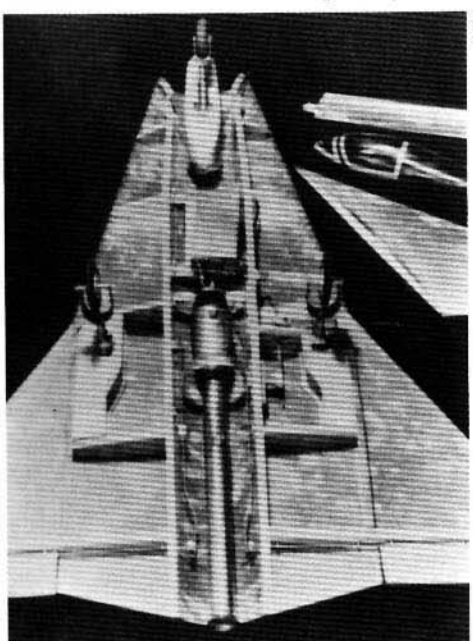
Complementing all of these was a requirement that the aircraft's various onboard systems be robust and easily accessed for servicing and parts replacement by a small number of unskilled personnel working under adverse weather conditions and while wearing bulky clothing and gloves.

Finally, the aircraft also was required to be so designed and constructed that not only was it a sound economical proposition well suited to its operational role, but also that it leave the largest possible assurance of development potential.

Bratt's design team, using the specification synopsized above, soon came up with a number of brash and innovative design studies. Several, labeled as Project (R) 1200, reflected the design team's inability to settle upon either a swept wing or delta wing configuration. By 1951, Project (R) 1200 had grown into the relatively unappealing Project (R) 1250 which, as it turned out, finally would employ the distinctive double-delta configuration that was destined to become the SAAB *Draken's* unmistakable trademark.

Though SAAB's design team was progressive in its fighter design philosophy, it soon found that in-country technological resources capable of supporting the research effort required for the project were sadly lacking. At the time, Sweden only had one supersonic wind tunnel in operation and this could accommodate only models of the new fighter in the scale of 1:50. Because of this, the company, with government support, undertook a massive (for Sweden) build-up of aerodynamic research capability. SAAB thus consummated the construction of its own wind tunnel for transonic testing and complemented this with further testing in US tunnels. Much of this work was in the nature of pure basic research with many of the problems eventually tackled simultaneously using several different research methods.

Prior to the intense research effort, questions concerning the aircraft's design remained, these including the aforementioned indecision concerning swept v/s delta wings; if a delta wing were chosen, for instance, questions arose as to whether it should be of high or low aspect ratio. Concern was even expressed over the jet



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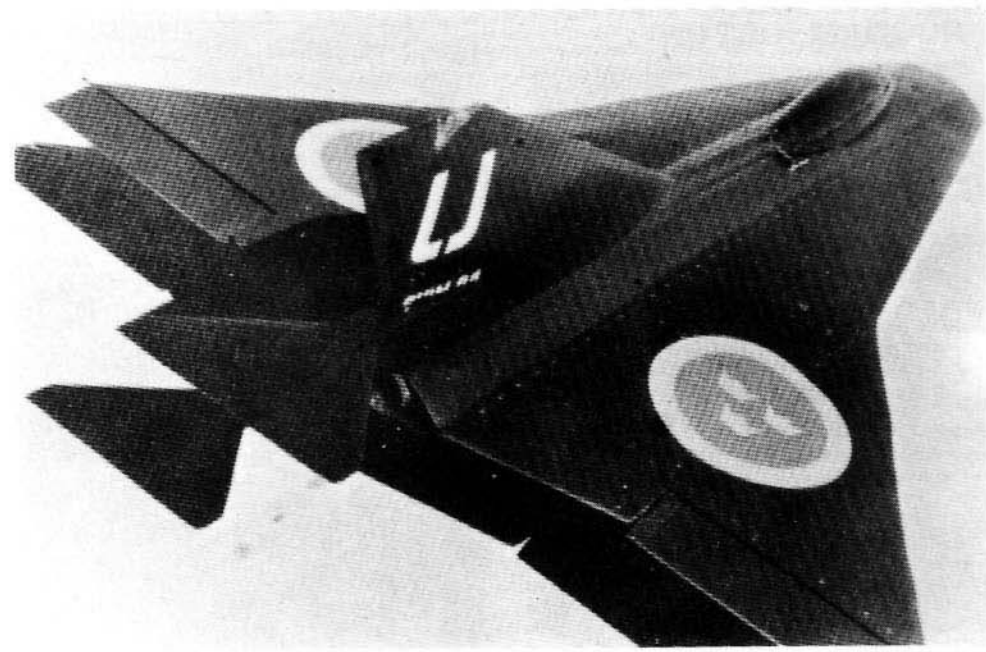
The scale models primarily were of wood construction and optimized for simplicity of maintenance and modification. The small pulsejet is noteworthy.



SAAB

Demands to study the effects of having a horizontal tail surface for increased pitch control were placed on SAAB by select "Flygvapen" officers. Accordingly, several U-control model configuration studies were undertaken, including one with a single horizontal surface attached to the vertical fin.

engine configuration as difficulties with early afterburner designs remained, and some SAAB engineers feared that an afterburner-equipped engine could become an Achilles heel.

The question concerning swept v/s delta wings quickly was resolved by the initial studies which had called for the exploration of a swept wing configuration. In short order it was determined that, in consideration of all other parameters placed upon the design, the swept wing's aerodynamic drag at high Mach numbers was too high, and its configuration requirements dictated that the fuselage have insufficient volume for equipment, fuel, and armament.

The delta wing, on the other hand, showed great promise following initial tunnel tests. The pure delta soon was ruled out, however, as it suffered from center of gravity (c.g.) and center of pressure (c.p.) anomalies that were difficult to alleviate. A derivative, however, often referred to as the double delta, proved much more flexible. In general, the double delta was found to offer the attributes of (1) reduced frontal area while permitting optimal wing area; (2) more favorable wing sweep angles on the center (inboard) wing section; (3) c.p. and c.g. being closer to each other; (4) more favorable area distribution; (5) low supersonic drag; (6) favorable low speed drag; (7) a strong and stiff, fail-safe structure; and (8) being able to place the air intake(s) farther forward.

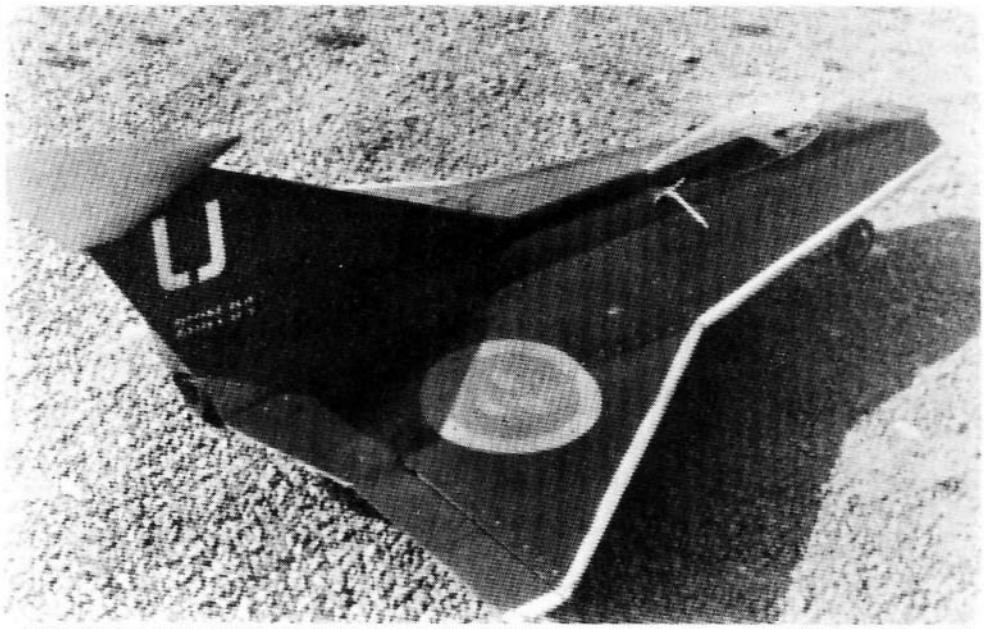
Continuing tunnel work rapidly solidified the team's initial impressions of the double delta configuration, and by 1949, it had been concluded that the proposed advanced fighter should have a double delta wing with a very small aspect ratio (1.77—which was almost unheard of in 1949).

Because of the many uncertainties surrounding what undeniably was a radical design, SAAB, under pressure from *Flygvapen* Air Staff members and others of a more conservative bent, elected to take their hardware work out of the wind tunnel and into the sky. Preliminary scale model work had been conducted with hand-launched paper models and this, in turn, was followed by an extensive series of powered U-control models built to various scales and in various configurations. Models made of wood with a wing span of 92 cm/3 ft. and having lengths of 110 cm/3.5 ft. were built each powered by a small ramjet engine or pulsejet. The latter generated a static thrust of approximately 2.1 kp./4.5 lbs.

The control system for the models was simple, consisting of piano wire from a stick outside the circular flight path passing through a post in the center. Initial flight trials using these models proved discouraging. One model was destroyed when fire caused by radiation heat from the small ramjet/pulsejet engine ignited construction materials, and two were destroyed because of the U-control system's poor response characteristics.

Still convinced that the basic design concept was viable, the SAAB engineering team and a small company

SAAB



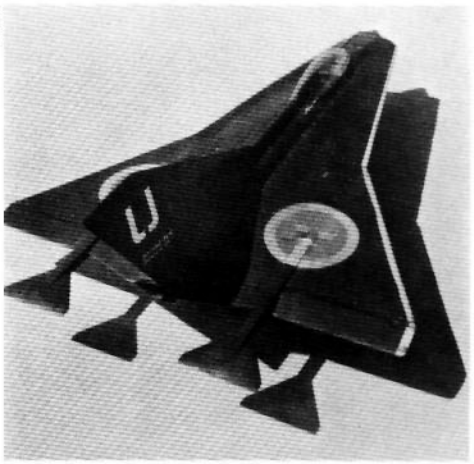
Another "tailed-delta" configuration tested in model form had the horizontal tail surface, itself delta-shaped, mounted on top of the vertical tail assembly. All other control surfaces on the aircraft were left essentially unchanged in terms of area, though their function was modified to complement the new surface.

flight test pilot department staff embarked on the development of a more elaborate model aircraft series. This time the models were built of 6 mm thick aluminum sheet and the engines were modified to be more reliable. Additionally, internal fuel capacity was increased to permit flight times of up to two minutes.

Takeoff weight of the new models was approximately 6 kg./13.2 lbs. With the "pilot" now flying the aircraft from the center post position (the center post also was equipped with a movie camera to record flight characteristics, a clock, an rpm counter, and an indicator to measure the elevon angle), control was considerably improved and success was realized almost immediately. The flight path radius was some 19 m/62.3 ft. and a single revolution usually took about 5 seconds. The only difficulty noted by "pilots" was the dizziness experienced in following the aircraft in a circle for almost 2 minutes!

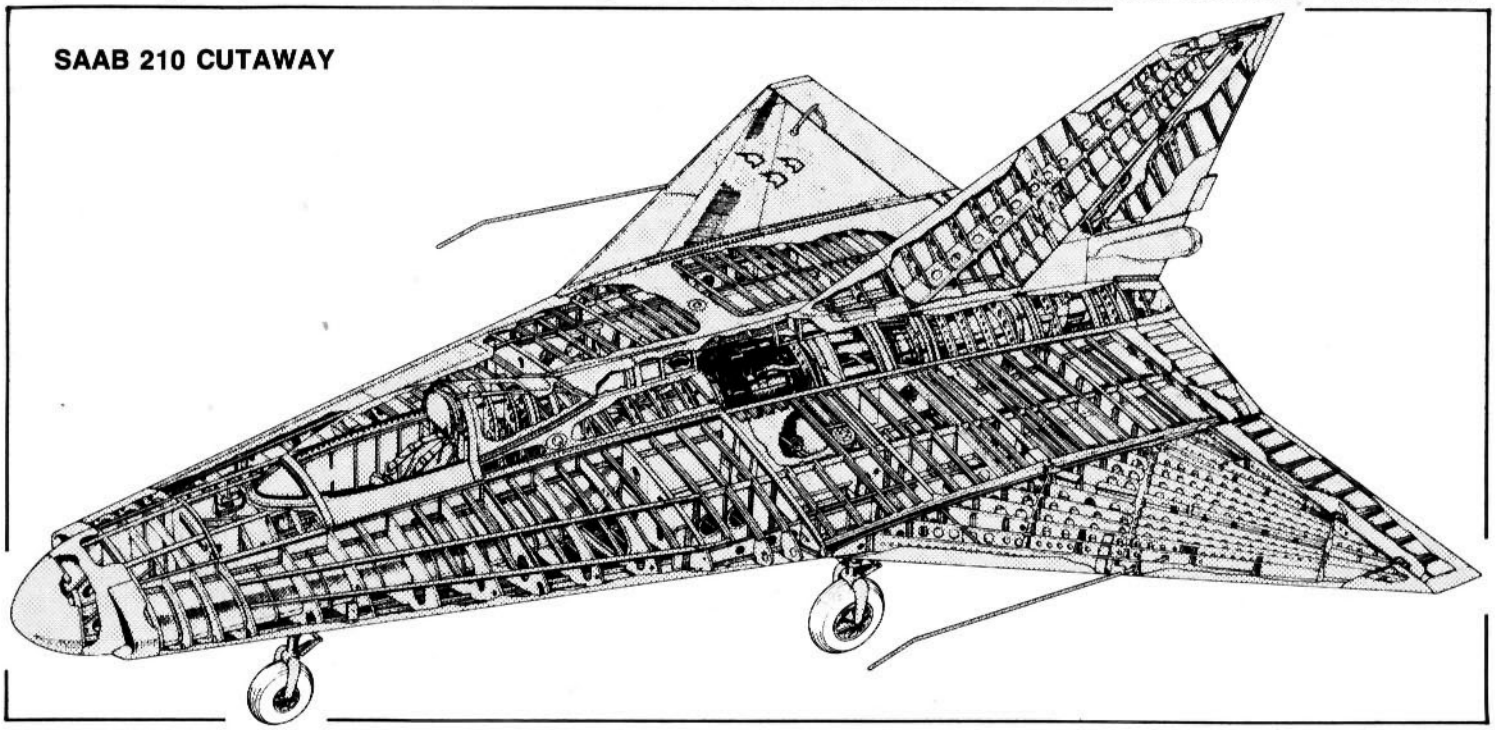
Work with the U-control models provided significant insight into the double delta's rather conventional flight characteristics and quickly convinced the pilots and SAAB engineers that their initial paper-generated conclusions were accurate. Different c.g. positions and takeoff weights were explored extensively, providing ex-

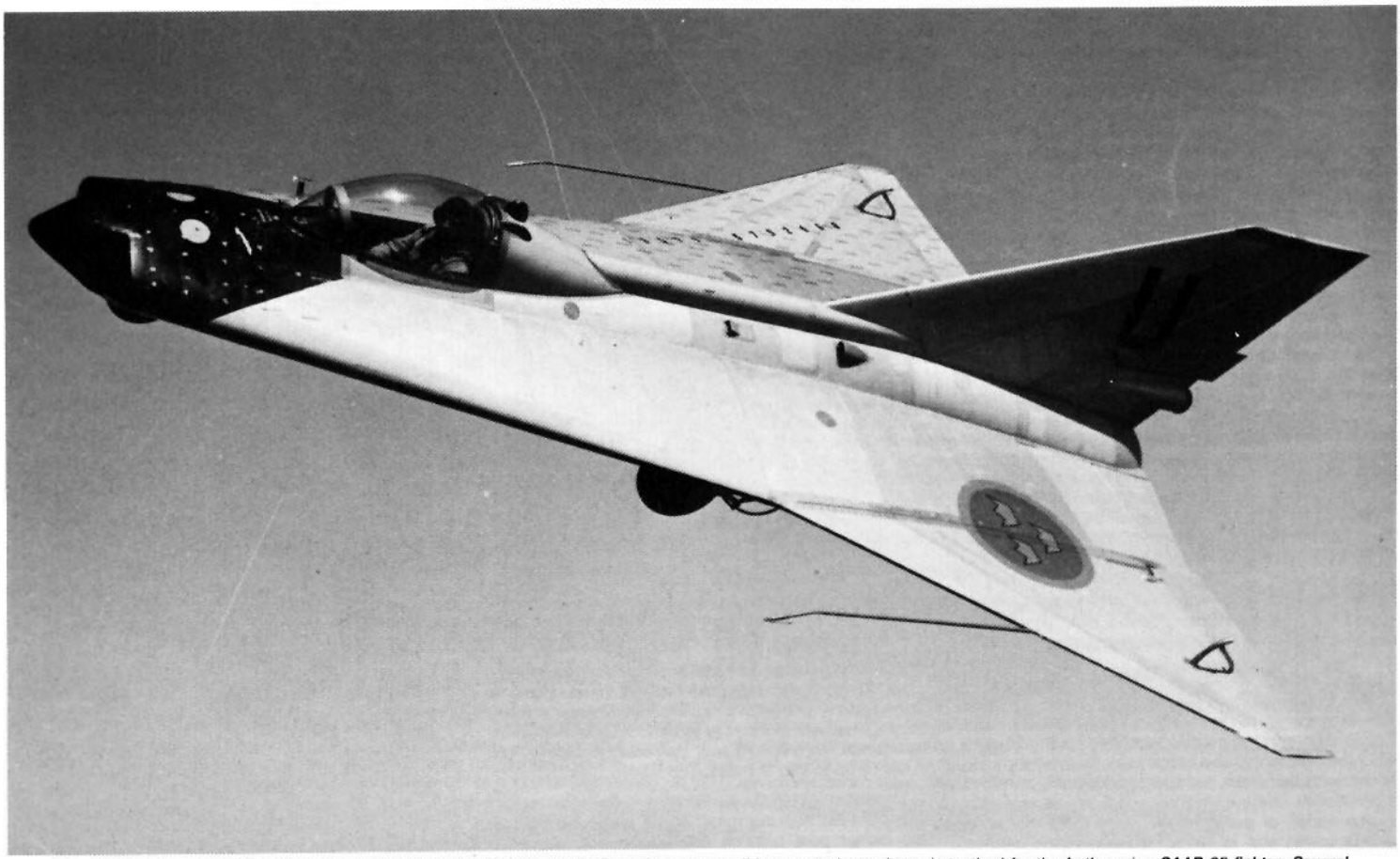
SAAB



Perhaps the most radical horizontal tail surface study employed the addition of two separate pitch control surfaces pylon-mounted aft of the wing trailing edge.

SAAB 210 CUTAWAY





SAAB via Göran Henriksson

The SAAB 210 was the first full-scale double-delta wing aircraft ever to fly and was a sensibly executed aerodynamic testbed for the forthcoming SAAB 35 fighter. Several different intake configurations eventually were tested on this aircraft, these helping SAAB settle on the definitive layout that would become so characteristic of the entire "Draken" family. The landing gear were not fully retractable on the SAAB 210 and were, in fact, partially exposed in flight.

Göran Henriksson

The SAAB 210 survived its flight test program, consisting of over 1,000 flights, and currently is on display at the Swedish Air Force Musuem at Malmslatt (normally it is stand-mounted indoors). It is seen with its last, and definitive nose modification—which became the standard configuration for the later "Draken". The powerplant for the SAAB 210 was developed from the Armstrong Siddeley "Mamba" turboprop by removing the latter's reduction gear and propeller drive.

cellent insight into the design's critical longitudinal stability characteristics.

In the meantime, *Flygvapnet* senior staff members who had been briefed on the SAAB project had generally remained in agreement with SAAB decisions. One general, however, had ordered that a horizontal tail be built for one of the models and flight tested. Three different configurations eventually were flown, these quickly revealing the tailed aircraft's inadequacies (landings were invariably a disaster).

Once the model data had confirmed the basic double delta concept, SAAB during 1950, under the auspices of the *Flygvapen*, elected to proceed with a full-scale flight test article. This one-off aircraft, eventually designated SAAB 210, was designed and built in a little less than 18 months. On January 21, 1952, following a spate of bad weather and the resolution of a control servo system problem, it took to the air for the first time, flying from SAAB's Tannefors airfield in Linkoping with company test pilot Bengt R. Olov at the controls.

The SAAB 210 was known initially as the *Draken*, but later was re-nicknamed *Lill-Draken* to differentiate it from the full-fledged fighter to follow. As a testbed, it proved not only ideal, but long-lived and quite versatile. Preconstruction design considerations permitted the center of gravity to be changed during flight by transferring liquid between two tanks (placed one in the front and one in the rear of the aircraft). The air intake configuration, though not quite by design, also proved changeable, and in fact was reconfigured on several occasions. It was discovered, for instance, that the aircraft's longitudinal stability was disturbed by vortices created by the air intake lips at high angles of attack. After considerable work, a definitive intake configuration was evolved, this eventually finding its way into the design of the full-fledged fighter, and remaining unchanged throughout the latter's production history.

Research work in many other areas, utilizing the diminutive SAAB 210 followed, including exploration of the effects of modifications to the wing in the form of fillet changes (in one instance, the wing was configured to superficially resemble that of an ogival delta configuration—reminiscent of the *Concorde*), wing fences, and vortex generators. Flight test work explored such nuances as pitch control, ground effect, and wing buffet.

At one time, due to the continuing insistance of the same *Flygvapen* general who had requested exploration of the same item in model form, a decision was made to install and flight test a horizontal tail surface. The tail was designed and built, but never mounted on the aircraft. Cancellation of this test followed shortly afterwards when the SAAB test pilot team, to a man, refused to fly the aircraft with the tail if it was installed. They had not forgotten the ill-fated flights of the U-control models.

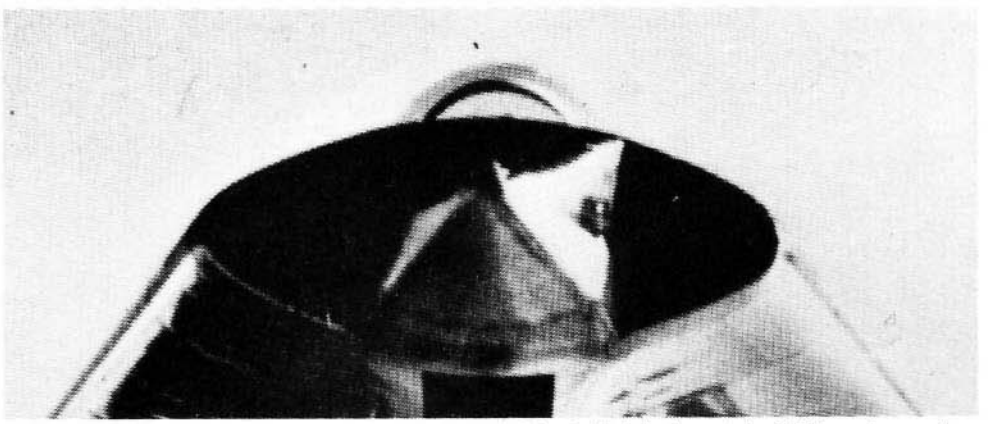
Powered by a single Armstrong-Siddeley *Adder* turbojet engine rated at 1,000 lb. th. (454 kgp) static, the SAAB 210 was not particuarly fast and was in fact, somewhat underpowered. High temperature days often cancelled flights, and on occasion, test hops were conducted as early as 2 a.m. in order to take advantage of cool night air.

It also should be mentioned that the SAAB 210 was the first Swedish aircraft to fly with a fully hydraulically-boosted flight control system. Hydraulic actuators had been interfaced with the aircraft's elevon-type pitch and roll control surfaces in the first successful indigenous attempt to provide the pilot with a control system power-assist device. Some 1,000 test flights were completed by this approximately half-scale aircraft, it eventually being donated to the Swedish Air Force museum at Malmslatt.

With the SAAB 210 program moving along quite successfully, and consequently consistantly underscoring the SAAB design team's (which, by this time had grown from 12 engineers in May, 1950, to nearly 30 in late 1952) faith in the double delta wing, the company, following a March.*Flygvapen* approval of a full-scale mock-up, during May, 1952, approved prototype hardware design work initiation on what now was being called the SAAB 35 *Draken* fighter.

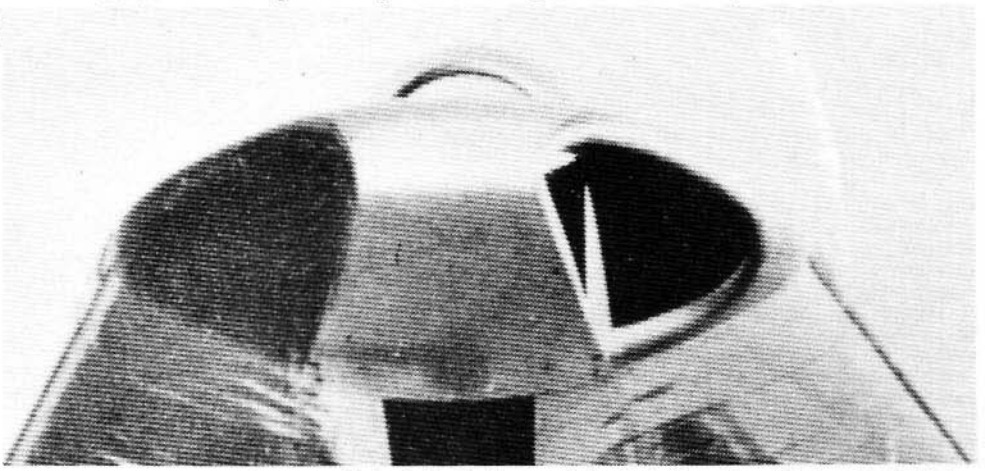
It should be mentioned at this point that not all research associated with the new fighter program had been undertaken with the SAAB 210. Considerable laboratory activity had, in fact, been ongoing throughout the testbed's extensive flight test program. A 30 ft. (9.1 m) diameter Ferris-wheel rig, for instance, was used to test the forthcoming *Draken's* fuel system under simulated flight conditions, while at SAAB's small climatic chamber, structural tests on major components and structural specimens were conducted at temperature extremes as great as 70° C and altitudes as high as 98,425 ft. (30,000 m).

SAAB



As first flown, the SAAB 210 nose and intake design carried the double-delta theme to its definitive extreme and made allowances for the bifurcated intakes only by cutting the corner sections out where the leading edge and the nose came together. Though viable, this design created severe nose space constraints.

SAAB



An intermediate nose proved unacceptable due to the fact it generated undesirable vortices at high angles of attack. These affected adversely the longitudinal stability of the aircraft in high aoa conditions. Other reasons for changing the nose design included its affect on forward visibility.

Flow studies were carried out in water tanks. In these tests, a model of the new fighter was plunged down through the water surface, which was covered with aluminum powder. The vortex pattern in the water thus could easily be studied by observing the resulting powder images.

Additionally, SAAB's sophisticated in-house computers and the government-owned Besk computer in Stockholm were used for extensive mathematical calculations; and a cannon for shooting dead birds at supersonic speed against the cockpit windscreen was utilized to test windscreen collision characteristics (a .5 kg. bird at 1,300 km/h [700 knots]).

Politically, the new *Draken* found sufficient support, both from government and military authorities, and Swedish citizens. It already was apparent that the program was to require a multi-million *Kroner* expenditure. It no longer was simply a major aircraft procurement project; by 1955, it had become an important philosophical step in national policy. And as with all such Swedish programs, it was pursued with extraordinary thoroughness, from start to finish.

With prototype design now well underway, the first tooling drawings were released during October, 1952. Following the finalization of the type specification during January, 1953, production tool design was started during March, and some five months later, during August, the first production orders, calling for the fabrication of four prototypes (three for flight test and one for fatigue testing; the latter eventually would be equipped with no less than 5,000 strain gauges; it also would clear the *Draken* airframe to a 12 g ultimate load) and three series test aircraft, officially were given, along with a single order for a complete nose section for a two-seat conversion trainer. Eventually, it was estimated that some 25,000 tools, 300 assembly jigs, and 3,500 subassembly jigs

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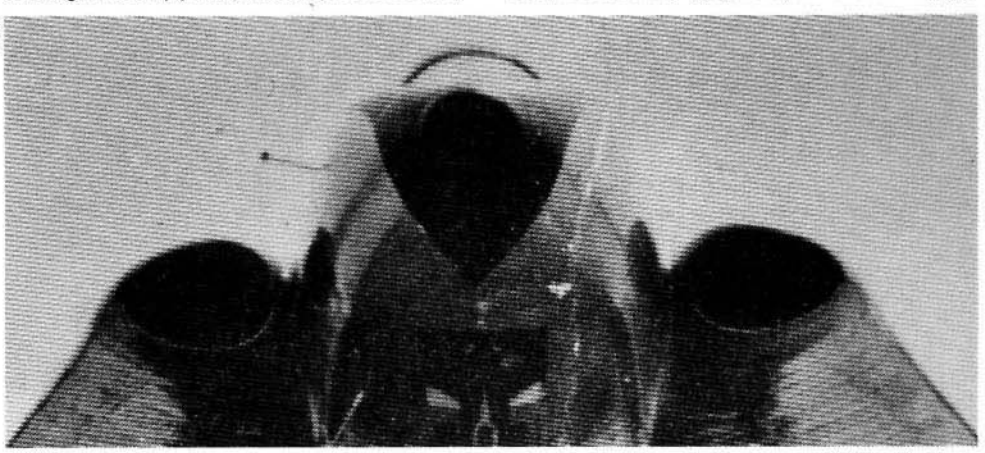
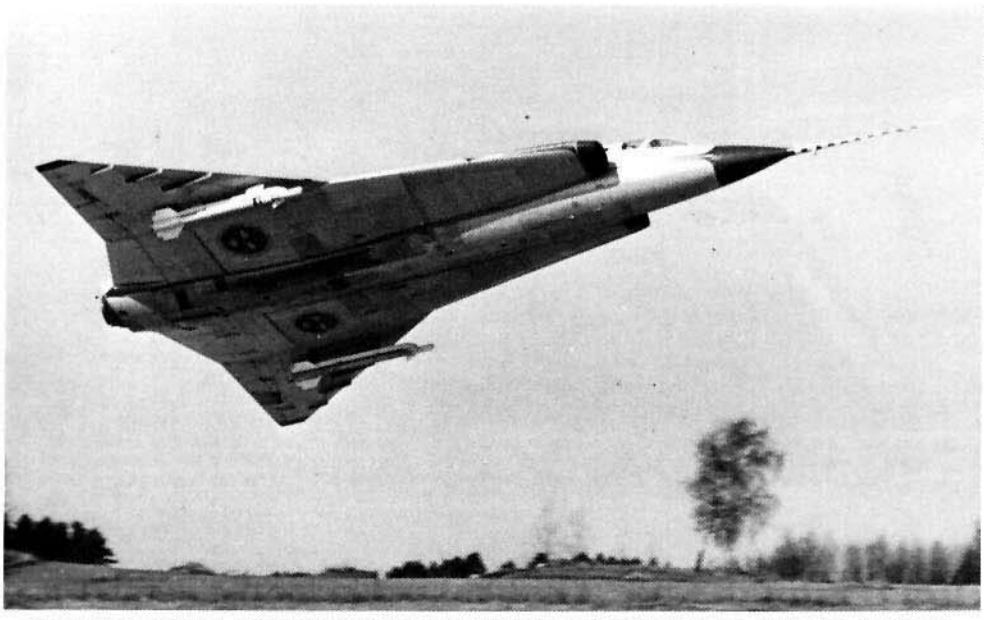


The definitive nose design permitted greater bifurcation of the intakes which in turn allowed more efficient utilization of available space ahead of the cockpit. This would prove of great value later for purposes of nose bay-mounting the SAAB 35's radar and optical reconnaissance systems.



SAAB via Göran Henriksson

The prototype J35, 35-1, during a low-level pass at the SAAB-Scania facility at Linkoping. At the time, the aircraft was involved in initial "Sidewinder" trials verifying the missile's aerodynamic compatibility when pylon-mounted under the wings. Distinctive prototype markings were red and white.

would be required for *Draken* production.

Following roll-out during the late summer of 1955, the prototype *Draken* (c/n 35-1) was ground tested and prepared for its initial flight. This event was consummated on October 25, 1955, at the company's Tannefors airfield with Bengt R. Olov at the controls. The other two flight test articles followed in short order and quickly were added to the flight test department inventory.

It should be mentioned at this point that the first three *Drakens* officially were designated SAAB 35 only (by the manufacturer) and given constructor's numbers, and that they did not have *Flygvapen* designations or serials. Also, these first three aircraft were powered by imported Rolls Royce RB-146 *Avon* turbojet engines. Initial production aircraft would differ in being powered by Swedish-built *Avon* derivatives designated RM6B and equipped with Swedish-built SFA Model 65 afterburners.

Flight test work with the prototypes progressed smoothly throughout the following twenty-four months. The first supersonic flight, which was accomplished utilizing the prototype aircraft, took place without using afterburner on January 26, 1956. Two months later, this same aircraft became the first of its type to go supersonic in a climb.

The number three prototype was, by this time, assigned to the *Flygvapen*, as was customary with Sweden's aircraft programs. Following initial preliminary flight trials, it was flown to Lulea, Sweden, and there utilized for winter testing in the coldest and most inhospitable spot in the country.

Though word of the existence of the new Swedish fighter had been circulating throughout the various military aviation communities around the world, it was not until a year after the prototype's first flight that the aircraft was unveiled publicly (via a stirring Olov aerial demonstration) for the first time.

Production of the SAAB 35 at SAAB's Linkoping plant, interestingly enough, was initiated some 100 feet below the earth's surface in a special production facility built to provide protection from enemy attack. Raw materials were trucked in down a lengthy spiraling ramp and once the resulting small components and sub-assemblies were completed, they slowly progressed upwards to the main production line. SAAB's production operations remain partially sub-surface to this very day.

The first flight of the first aircraft in the initial pre-production *Draken* batch, by now referred to as the J35A-series, took place on February 15, 1958, at Linkoping, with company pilot Karl-Erik Fernberg at the controls, utilizing the fourth *Draken* off the line, 35001. After further flight testing, Fernberg later would report:

> "The SAAB 35 is easy to fly and is even easier to land than its predecessor, the SAAB 32 *Lansen*. The "35" has a normal stalling speed of only 210 kmh (130 mph) but has been flown at 190-200 kmh (118-124 mph) during test at altitude. It can not be stalled under normal flying conditions, and has good control response down to very low speeds. The SAAB 35 has previously been stated to have low-speed characteristics permitting operations from relatively small airfields. It can now be disclosed that using a braking parachute and normal braking, the aircraft required less than 600 meters (2,100 ft.) of runway for landing. In fact, during a recent demonstration of its landing characteristics, a SAAB 35 was landed using only some 450 meters (1,500 ft.) of runway without overheating the brakes. Using afterburner, the takeoff run is no problem whatsoever."

Production of this initial series was fully underway by mid-1959. The first 20 aircraft were not considered up to full production standard, however, due to mid-production fit and component changes, but by aircraft 21, these had stabilized and all following samples were consistent. One other change, however, should be noted, as the Swedish-built SAF Model 65 afterburner found on the first 62 aircraft was updated to the Model 66 (which increased the overall length by 2' 6-1/4") from aircraft 63 onward.

Göran Henriksson collection

F18 J35Bs are seen being towed from a mountain shelter somewhere in Sweden. Such underground shelters are commonplace in this Scandanavian country and are thought to offer protection from surprise attack. Rapid deployment of the aircraft from these shelters, assuming some forewarning of attack, easily is achieved.

BASIC VERSIONS:

Note: the Swedish prefix letter J stands for *jakflygplan*, which means fighter; the Swedish prefix Sk stands for *skolflygplan*, which means literally school aircraft; and the Swedish prefix letter S stands for *spanning*, which means reconnaissance.

J35A (A stands for "Adam" in the Swedish phonetic alphabet)—first flown on February 15, 1958, the initial interceptor version was powered by a Svenska Flygmotor RB6B (license-built Rolls Royce *Avon* 200-series) turbojet. The first 62 aircraft had Swedish-developed Model 65 afterburners increasing static thrust from 11,245 lbs. (5,100 kgp) to 15,190 lbs. (6,890 kgp). Beginning with the 63rd aircraft in the J35A series, the improved Model 66 afterburner was installed during production with the aircraft's overall length being increased and a dual retractable tail wheel unit being fitted in place of the original tail bumper; several of the early production machines later were brought up to the same standard. The J35As were fitted with a SAAB S6 fire-control system (including a French-designed Thompson-CSF *Cyrano* gun-ranging radar built under license by L. M. Ericsson) or a S6B fire-control system (with the addition of an infrared seeker), and a basic-altitude hold Lear autopilot. Armament comprised a pair of British-designed *Aden* 30 mm cannon, with 90 rounds per gun, on the edge of each inboard wing which could be supplemented by four Rb.24 (Swedish-built AIM-9B *Sidewinder*) infrared-homing air-to-air missiles. The 592 US gal. (2,240-liter) internal fuel capacity could be supplemented by four 79 US gal. (300-liter) drop tanks beneath the fuselage and inner wings. Ninety J35As (*Flygvapnet* serials 35001 to 35090) were built but 25 later were converted to Sk35C two-seat trainers, three (35007, 35008, and 35013) were modified as development aircraft for the J35F version, and one (35011) became the one-off J35H prototype. Primarily used for training, J35As were operated by F13 and F16 *flygflottiljer*, with the latter retaining its A-series aircraft until 1976.

J35B (B stands for "Bertil" in the Swedish phonetic alphabet)—First flown on November 29, 1959, the J35B was the first truly operational interceptor version of the *Draken*; it also had a secondary fighter-bomber capability. These aircraft retained the RM6B engine with the Model 66 afterburner and lengthened fuselage of late production J35As, but were fitted with the SAAB S7 collision-course fire-control system as well as electronic equipment integrated with Sweden's STRIL-60 semi-automatic air defense control system (STRIL is the abbreviation of *Stridesledning och Luchbevakning*, or Intercept Control and Early Warning; this was a sophisticated national air defense system planned by Sweden during the early 1950s and eventually implemented during the 1960s). The 30 mm cannon and *Sidewinder* missiles of the J35A version could be supplemented by four external pods each containing twelve 5.3 in. (135 mm) air-to-ground rockets, or four 55 lb. (250 kg.) or nine 220 lb. (100 kg.)

bombs. The *Flygvapnet* received 89 J35Bs which were assigned serials 35201 to 35289.

During 1972, pending delivery of its J35Fs, Finland leased six ex-*Flygvapnet* J35Bs (35214, 35243, 35257, 35261, 35265, and 35266) as interim fighters. In *Ilmavoimat* service, they were assigned serials Dk-208, DK-210, DK-212, DK-204, DK-202, and DK-206, respectively, and the designation J35BS. Eventually these six aircraft were purchased outright from Sweden.

Sk35C (C stands for "Ceasar" in the Swedish phonetic alphabet)—Fifty months after the maiden flight of the single-seat *Draken*, the prototype of the two-seat dual-control training version (35800) was flown for the first time on December 30, 1959. Featuring a new forward fuselage, with the instructor located behind the student on a slightly raised ejection seat, the Sk35C retained the early RM6B engine and short Model 65 afterburner of the initial production J35As. The cockpits were enclosed by a long framed canopy hinged on the right side; an inner blast screen was mounted ahead of the instructor's cockpit; and a periscope was provided for the instructor to accommodate his forward vision requirements. To provide space for the second cockpit, some equipment was relocated and the size of the forward fuel tank was reduced; this reduction in fuel capacity partially was offset by the installation of tanks in place of the cannon. Lacking the guns and radar of the single-seater, the Sk35C nevertheless could be used for armament training with *Sidewinder* missiles and other external stores. In addition to the prototype, the *Flygvapnet* obtained 25 Sk35Cs by conversion of J35A airframes as follows:

35801 from J35A 35035
35802 from J35A 35040
35803 from J35A 35038
35804 from J35A 35016
35805 from J35A 35006
35806 from J35A 35007
35807 from J35A 35022
35808 from J35A 35009
35809 from J35A 35008
35810 from J35A 35019
35811 from J35A 35017
35812 from J35A 35020
35813 from J35A 35012
35814 from J35A 35031
35815 from J35A 35005
35816 from J35A 35015
35817 from J35A 35021
35818 from J35A 35032
35819 from J35A 35029
35820 from J35A 35036
35821 from J35A 35030
35822 from J35A 35024
35823 from J35A 35037
35824 from J35A 35033
35825 from J35A 35034

Assigned initially to the F16 Wing (Uplands *Flygflottilj*) at Uppsala, the Swedish Sk35Cs were used during the early 1960s to provide a 25-hour conversion course to new pilots with only 150 hours of prior training on Sk50 *Safirs* and Sk28 *Vampire* trainers. During 1985, a small number of Sk35Cs remained operational with F16 at Uppsala for operational training of pilots with prior experience on Sk61s and Sk60s.

Three Sk35Cs (ex-35803, ex-35820, and ex-35823) later were sold to Finland where this version was known as J35C or J35CS. The three aircraft were assigned Finnish serials of DK-266, DK-264, and DK-262, respectively.

During 1968, Denmark ordered three TF-35s (SAAB-35XTs) as part of its initial contract for *Drakens*; follow-on orders for eight TF-35s were placed during 1970 and 1973. Bearing the Danish serial numbers AT-151 through AT-161, these two-seat combat trainers combined the Sk35C airframe with the systems (less radar), armament, and engine of the SAAB 35XD single-seat aircraft.

J35D (D stands for "David" in the Swedish phonetic alphabet)—The J35D version represented a marked improvement over earlier *Draken* versions, both in terms of performance and combat capabilities. The former was obtained by replacing the RM6B engine with an RM6C (license-built *Avon*-300 series), thus increasing maximum thrust with the Model 66 afterburner from 15,190 lb. to 17,086 lb. (6,890 kgp to 7,750 kgp). Systems improvements notably included the use of a SAAB FH5 automatic pilot in place of the license-built Lear unit of earlier versions, and of a SAAB 73SE-F rocket-boosted ejection seat which enabled safe ejection from the ground at speeds above 100 kmh (62 mph); later, the RS-35 zero-zero ejection seat replaced the 73E-F seat. Internal fuel capacity was increased.

The J35D prototype (modified from a J35A) first flew

SAAB via David Anderton

The first J35A, 35001, on January 16, 1959, shortly after having been modified to late-J35A standard. As such it incorporated an extended tailcone for the Model 66 afterburner, and the new tailwheel assembly. It also had an unorthodox dorsal antenna arrangement and a pitot boom for test purposes.

SAAB

Two early J35As of F13 Wing during formation maneuvers. The aircraft was still new to "Flygvapen" at the time. Noteworthy is the lack of tail coding of any kind. Also noteworthy is the small, ventrally-mounted tail bumper which superficially resembled a ventral fin on the underside of the empennage.

on December 27, 1960, and serials 35301 to 35393 were assigned to the 93 *Drakens* of this model produced for the *Flygvapen*. The first J35Ds went to F13 at Norrkoping, completing conversion during early 1964. F3 at Malmslatt and F10 at Angelholm were next to receive this model. Subsequently, 27 J35Ds were converted to S35Es.

S35E (E stands for "Erik" in the Swedish phonetic alphabet)—First flown on June 27, 1963, the S35E was a photographic reconnaissance version of the *Draken* intended to complement in *Flygvapnet* service the slower, but more comprehensively equipped S32C *Lansen*. Based on the J35D airframe, and retaining the RS-35 zero-zero ejection seat and RM6C engine with Model 66 afterburner of the J35D, the S35E carried seven French-designed *Omera* cameras for daytime use at all altitudes and was equipped with a special optical camera sight to permit accurate camera aiming. For easy access to the nose-mounted photographic equipment (which included one Ska16B forward oblique camera and four SF24 short- and long-focal length cameras), the nose cone slid forward on rails. Two Ska24-600 cameras and a Jugner optical sight were housed in the space normally occupied by the *Aden* cannon on the fighter version. For night photography, the aircraft was equipped with ejectable flash bombs.

The S35E initially retained the SAAB FH 5 flight control system and its associated SAAB 05 autopilot, PN-59/A and PN-793/A navigation equipment, and Fr 17 VHF and Fr 16 VHF (standby) communications equipment. Later, many of these systems were upgraded, changed, or removed.

Entering service on August 17, 1965 with F11 at Nykoping, and also being provided F21 at Lulea, the S35Es had their sensor equipment upgraded during 1973 when British *Vinten* cameras for night and low-level missions were mounted in externally carried pods. The *Flygvapnet* received a total of 60 S35Es; 33 were built as such (35901 to 35932, and 35960) and the other 27 were converted from J35D airframes as follows:

35933 from J35D 35288
35934 from J35D 35282
35935 from J35D 35289
35936 from J35D 35302
35937 from J35D 35296
35938 from J35D 35287
35939 from J35D 35297
35940 from J35D 35284
35941 from J35D 35294
35942 from J35D 35283
35943 from J35D 35303
35944 from J35D 35276
35945 from J35D 35299
35946 from J35D 35291
35947 from J35D 35301
35948 from J35D 35279

Bjorn Karlsson

The J35B was the first truly operational version of the "Draken" to enter the "Flygvapen" inventory and though an interceptor, it could be used as a fighter-bomber. It was equipped with the Model 66 afterburner and the associated lengthened tail cone assembly, and also the SAAB S7 collision-course fire-control system.

Göran Henriksson collection

The prototype Sk35C two-seat trainer, 35800, flew for the first time on December 30, 1959, some four years after the first flight of the prototype "Draken". Changes to the airframe to accommodate the second seat were virtually non-existent.

SAAB via Göran Henriksson

Following its use as a prototype for the two-seat configuration, the first Sk35C, 35800, was used by the Swedish Air Force test center as a SAAB 05 air-to-ground missile testbed. Special markings and a modified back seat periscope were provided.

SAAB

An early J35D during armament tests with the Rb27-designated Swedish-built derivative of the Hughes AIM-4 "Falcon". This weapon proved to be decidedly ineffective when used by American aircraft during the air war over Vietnam.

SAAB via Göran Henriksson

The prototype S35E, 35901, during an early test flight over Linköping and generally sans all markings with the exception of the Swedish insignia on the forward fuselage. The S35E was based on the improved J35D airframe and powerplant.

35949 from J35D 35295
35950 from J35D 35286
35951 from J35D 35300
35952 from J35D 35290
35953 from J35D 35293
35954 from J35D 35298
35955 from J35D 35280
35956 from J35D 35292
35957 from J35D 35277
35958 from J35D 35285
35959 from J35D 35281

J35F (F stands for "Filip" in the Swedish phonetic alphabet)—The definitive interceptor version of the *Draken* was an improved J35D retaining the RM6C engine and RS-35 ejection seat and introducing the updated Model 67 afterburner and SAAB S7B collision-course fire-control system. Information was fed to the S7B from a powerful Ericsson PS-01 (or -01A) radar and a Hughes-developed infrared sensor built under license by Ericsson. Aircraft without the infrared scanner under the nose radome were given the designation J35F-1 ("Filip Ett") whereas those with the scanner carried the designation J35F-2 ("Filip Tva").

The J35F featured major improvements to the nav/attack, autopilot, air-data, and data link systems, as well as new instruments and a bigger, slightly bulged clear-vision canopy. In addition, internal fuel capacity was increased once more to 4,000 liters (1,057 US gallons).

Compared with earlier *Draken* versions, the J35F was a significantly more potent warplane as its armament, both for its primary air intercept mission and its secondary ground attack mission, was greatly increased. As an interceptor, the J35F relied essentially on four license-built Hughes *Falcon* air-to-air missiles (two 262 lb./105 kg. Rb.27s with a semi-active seeker and two 134 lb./61 kg. Rb.28s with infrared homers). Alternatively, four Rb.24s (license-built *Sidewinders*, initially AIM-9Bs but later AIM-9Ps) could be carried. For the ground attack role, the J35F was provided with 11 stores pylons, three on the fuselage and four under each wing, with the five inner stations being stressed for 1,102 lbs. (500 kg.) loads and the others for 220 lb. (100 kg.) loads. In both instances, internal armament was reduced to a single 30 mm cannon as the gun in the left wing root was replaced by an electronics package.

The development of the J35F required a major research and development effort with two early *Drakens* (J35Ds serials 35007 and 35008—which lacked most J35F features, but as J35F prototypes made the first flight of this variant during early 1961) being used from 1963 onward as armament prototypes to fire Rb.27 and Rb.28 missiles. Another aircraft, serial 35013 (which had been built as a J35A and subsequently brought up partially to J35D standards) later joined the program and received most of the systems planned for production J35Fs.

The J35F entered operational service with F13 at Norrkoping during 1965. A total of 208 J35Fs (35401 to 35608) was built for the *Flygvapen*, making this the most-produced *Draken* variant of all. Later, as the type was being replaced in Swedish service by the SAAB JA37 *Viggen*, a number of surplus aircraft were exported. Finland first acquired six J35Fs and later placed a follow-on order for 20 more. More recently, it was announced that Austria would purchase 24 ex-*Flygvapen* J35Fs.

The J35F recently has become the subject of a significant update program within the confines of the *Flygvapen* and the resulting aircraft (originally referred to as the J35F Mod) now is designated J35J. The J35J basically is an upgraded conversion of the J35F and features two additional inboard underwing stores pylons which enable it to operate with either four external tanks and two missiles, or four missiles and two tanks. Additionally, it has a much-improved primary radar, an updated infrared target seeker, an improved IFF system, and other miscellaneous changes.

J35H (H stands for "Helvetia" [Latin name for Switzerland] in the Swedish phonetic alphabet)—As Switzerland also is a neutral nation, the Swedish government had no objection to SAAB's endeavor to export its supersonic fighter to that small alpine country. To serve as a demonstrator for the proposed J35H, a single J35A (35011) was fitted with a British-manufactured Ferranti *Airpass* fire-control radar. During 1960, this aircraft was evaluated thoroughly in Switzerland with generally favorable results. The J35H was not, however, the only aircraft being considered, and by the time the low-key competition ended, the *Schweizerische Fliegertruppe* had concluded that the French submission, a slightly modified Dassault *Mirage III*, was more ideally suited to its DeHavilland *Vampire* replacement requirement.

Following the conclusion of the Swiss competition, the one-off J35H was returned to Swedish standards and absorbed back into *Flygvapnet* service.

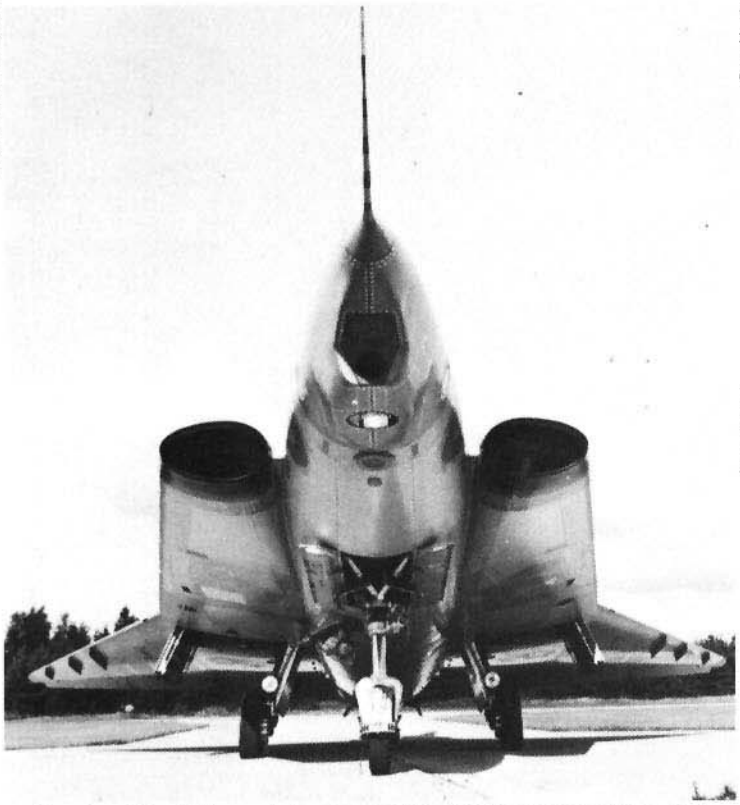
SAAB 35XD (a company designation in which X stood for export and D for Danmark, or Denmark)—Development of an export version of the J35F was announced by SAAB during May, 1967, and, although Denmark was a NATO member, the Swedish government did not object to sales presentations being made to its neighbor. SAAB's efforts were rewarded on March 29, 1968, when the Danish Defense Ministry ordered 20 single-seat fighters and three two-seat trainers; a follow-on order for 23 photo-reconnaissance aircraft was placed less than three months later. Subsequently, however, the Danes increased and revised their orders, finally acquiring 20 single-seat fighters (designated F-35 in Danish service), 20 single-seat reconnaissance aircraft (designated RF-35), and 11 two-seat trainers (TF-35s).

The first flight of this first production export *Draken* (A-001—an F-35) variant took place on October 31, 1969. It was delivered to the Royal Danish Air Force on January 29, 1970, followed by A-002, A-003, and A-004, on September 1. These aircraft went to 725 Squadron at Karup Air Base, there replacing the unit's tired North American F-100Ds. Subsequently, the RF-35s that followed also went to 729 Squadron, replacing the unit's Republic RF-84Fs.

All three versions of the export aircraft used basically the standard J35 airframe, with the RF-35s featuring a camera nose similar to that of the S35E. The TF-35 had a two-seat cockpit derived from that of the Sk35C and had integral fuel tanks built in the wings to boost internal fuel capacity to over 1,321 US gals. (5,000 liters), and a field arrester hook. Primarily intended to be used in the fighter-bomber role, the Danish F-35s have neither the weapons fits for the *Falcon* missiles nor the electronic links with the STRIL 60 air-defense sytem of the Swedish J35Fs. On delivery, the F-35 armament consisted of two wing-mounted 30mm cannon and the ability to carry up to 9,000 lbs. (4,082 kg.) of external stores on nine hardpoints.

SAAB 35XS (export version for Suomi, or Finland)—Also initially lacking the *Falcon* missiles and data link of the *Flygvapnet's* J35Fs, the SAAB-35XSs were ordered by Finland during April, 1970. Twelve of these aircraft

Göran Henriksson collection



Nose view of the S35E reveals the accommodations for its nose- and wing-mounted cameras. The cameras, initially of French origin and later of British, essentially replaced the internally-mounted weapons and radar of the J35D.

Peter Liander

J35D, 35365 (?), of J21, during its landing roll-out with tailwheel in runway contact and drag-chute deployed. This aircraft, though a "David", is equipped with a canopy from a "Filip". Noteworthy is the extreme up-angle of the elevons.

Björn Karlsson

A J35F¹, with two wing-pylon-mounted Rb27 "Falcon" air-to-air missiles, during testing of the latter. The aircraft is equipped with one fuel tank (left side) and one special test pod that appears to be equipped with a forward-facing camera.

Göran Henriksson collection

A J35F¹, 35486, apparently at Linköping, shortly after roll-out from the SAAB factory. The aircraft is unpainted except for the tail identification numbers. The J35F¹s can be distinguished from the J35F²s by the lack of an infrared sensor ball and fairing under the nose. The J35F's slightly bulged canopy is apparent in this view. Noteworthy and not often seen is the extended airbrake on the aft fuselage.

SAAB via Göran Henriksson

F1 Wing J35F¹, 35491, with armed "Falcons" on its wing pylons, at a Swedish road base. The ability to operate from such back-woods facilities has given the "Draken" a distinct advantage in its dual role of fighter and fighter/bomber.

Göran Henriksson collection

The SAAB 35XD prototype, A-001, for the Royal Danish Air Force, during armament trials where it carried no less than six 1,000 lb. iron bombs and two 1,275 liter drop tanks.

Bjorn Karlsson

An F1 Wing J35F[1]. The camouflage is standard for type. Noteworthy are the bulged canopy and single-piece windscreen, the extended tailwheel assembly, and the lack of an infrared sensor under the nose (distinctive to early "Fs").

Bjorn Karlsson

An F3 Wing J35D. This aircraft is equipped with a centerline-mounted SAAB-manufactured rocket pod that contains tubes for nineteen 75mm Bofors air-to-air rockets. As many as four of these pods can be carried by the J35D at one time.

Goran Henriksson

F3 Wing J35F[2], 35608. Typical of this variant is the nose mounted, Hughes-developed infrared sensor. In a clear-air-mass environment, this unit has a range of approximately sixteen miles. This aircraft is equipped with a wing-mounted Rb28.

Bjorn Karlsson

A J35D of F4 Wing just moments away from touchdown. Barely visible under its left wing is a single Rb24 (old designation, Rb324) "Sidewinder" infrared homing air-to-air missile. This weapon is quite similar to early models of the US "Sidewinder".

were assembled by *Valmet OY* at Tampere and Kuorevedon, Finland, from locally produced components and components supplied by SAAB. Their communications equipment was similar to the Swedish fit rather than to the fit of the NATO-compatible SAAB-35XDs acquired by Denmark.

OPERATIONAL SERVICE:

Svenska Flygvapnet (Swedish Air Force)—*Draken* fighter variants were operated by *divisioner* (squadrons) of ten *Flygflottiljer* (wings). The Sk35C training and S35E reconnaissance versions both served with the *divisioner* of two *flygflottiljer*. At peak strength, J35s equipped 17 *divisioner*, but budgetary constraints and conversion to the JA37 *Viggen* beginning during 1980 forced a steady reduction in the *Draken* fighter force; during 1978, F12 became the first J35 *flygflottilj* to be disbanded.

As often is done with Swedish military aircraft, the first F35 deliveries were made to F13 wing at Norrkoping during March, 1960. Because F13 was close to SAAB's factory, close contact between the *Flygvapen* and company engineers was possible during the early days of *Draken* service.

F13's conversion from the J29 took nearly a year to complete and in the meantime, following initial deliveries to that wing, other early J35As went to F16 at Uppsala. During the succeeding four years, all J35As in use with F13 were converted to either J35B or Sk35C (two-seat trainer variant) standard, while the rest of the wing was converted to the J35D. F16 transitioned into the J35B during 1961, with most of its J35As going to the *Draken* conversion unit which also was based at Uppsala. The following year, F18 at Tullinge began converting to the *Draken*.

During the early 1960s, F18, using J35Bs, formed the famed "Acro Delta" aerobatic team. This was followed, during 1966, by F16 becoming the *Flygvapen's* dedicated aerobatic squadron. During that year F16 performed at a variety of national and international displays.

On September 7, 1959, the *Draken* was demonstrated outside Sweden for the first time when J35A, 35001, in the hands of test pilot Ceylon Utterborn, was used during a stunning aerial demonstration at Basel, Switzerland. The demo proved to be Sweden's first visible attempt to sell the *Draken* to an entity other than the *Flygvapen*.

F13 and F16 eventually were followed by F1, F3, F4, F10, F11, F12, F17, F18, and F21. In addition, the *Forsokscentralen* (Research Center) at Malmslatt was provided with *Drakens* for research purposes, with aircraft such as S35Es 35902 and 35959 being representative.

As with almost all military aircraft programs, studies calling for a new aircraft to replace the *Draken* had begun almost before the first aircraft rolled off the Linkoping production line. Eventually, by the early 1960s, an improved fighter design optimized, like its predecessor, to function within the STRIL 60 network, was progressing rapidly toward the actual hardware stage. By the time of the SAAB 37 *Viggen's* first flight on February 8, 1967, it had become apparent that the *Draken's* days in *Flygvapnet* service were on the wane.

During the spring of 1984, having been progressively replaced by JA37s, Sk37s, and SF37s/SH37s in the intercept, training, and reconnaissance roles, the *Draken* equipped nine *divisioner* (two with J35Ds in F4, three with J35Fs in F10, one with J35Fs, and two with a mix of J35Fs and Sk35Cs in F16, and one with J35Ds in F21). At that time, further re-equipment was announced with F4, F16, and F21 to convert to JA37s during 1984/85. In lieu of the desired, but financially not feasible acquisition of additional JA37s, the three *divisioner* of F10 will retain their J35Fs and take over the Sk35Cs of F16. Thus, the highly reliable *Draken* will remain in service with the *Flygvapen* until at least the early 1990s.

The most recent *Flygvapnet Draken* activity, as of May, 1987, includes the conversion of F10 at Angelholm, to the J35J (originally referred to as the J35F Mod), of which some 50 now are scheduled to be refurbished and delivered by the end of 1989.

Praised by pilots and maintenance personnel, the *Draken* has had a worthy but relatively undramatic operational career with the *Flygvapen* for more than a quarter century. Noteworthy is the fact that J35s brought back the first clear, air-to-air photographs of the Soviet Tu-26M *Backfire* bomber, which was encountered over the Baltic Sea where Swedish fighters often escort NATA and Warsaw Pact aircraft.

In *Flygvapnet* service, *Drakens* have carried, and continue to carry a five-digit FV serial number (e.g., 35460) on the rear fuselage sides. The first two digits identify the aircraft type and never change during the aircraft's service career, whereas the last three, which are sequential within each version of the aircraft, are changed if the aircraft is modified to a new standard (e.g., 35288, built as a J35D, became 35933 after conversion to S35E standards). In addition, each aircraft has the numerical designator of its wing on the nose (e.g., 10 for F10 wing, located at Angelholm) and an individual aircraft number (kod) on the tail (e.g., tactical jet aircraft use numbers 1 through 69, although some usage of higher numbers has been noted); both can change when the aircraft is assigned to a different wing, but the unit code can change only if a reorganization takes place within the wing. Each fighter wing also has a tactical radio call sign using the Swedish-language phonetic alphabet designator corresponding to the position of the wing's number in the alphabet (D for "David", the fourth letter of the alphabet, for F4 wing; J for "Johan", the tenth letter, for F10 wing, etc.). The examples listed here add up to J35D *Draken*, FV serial 35460, unit code F10-25, radio call sign "Johan 25".

The following table—which provides the name of each *flygflottiljer*, their bases and tactical call signs—summarizes *Draken* service by models:

FLYGVAPNET DRAKEN WINGS

Wing	Wing Name (i.e., Region)	Location	Tactical Callsign	Status in 1985	Years of Service					
					J35A	J35B	Sk35C	J35D	S35E	J35F
F1	(Vastmanlands Flygflottilj)	Vasteras	A for Adam	Disbanded	-	-	-	-	-	66-83
F3	(Osgota Flygflottilj)	Malmslatt	C for Caesar	Disbanded	-	-	-	64-70	-	70-73
F4	(Majtlands Flygflottilj)	Froson	D for David	JA37	-	-	-	69-84	-	-
F10	(Skanska Flygflottilj)	Angelholm	J for Johan	Current	-	66-76	85-??	64-79	-	69 to date
F11	(Sodermanlands Flygflottilj)	Nykoping	K for Kalle	Disbanded	-	-	-	-	65-76	-
F12	(Kalmar Flygflottilj)	Kalmar	L for Ludwig	Disbanded	-	-	-	-	-	68-78
F13	(Bravalla Flygflottilj)	Norrkoping	M for Martin	JA/SF/SH37	60-65	-	-	63-66	-	65-81
F16	(Upplands Flygflottilj)	Uppsala	P for Petter	JA37	61-76	62-65	??-85	-	-	76-85
F17	(Blekinge Flygflottilj)	Ronneby	Q for Quintus	JA/SF/SH37	-	-	-	-	-	72-82
F18	(Sodertorns Flygflottilj)	Tullinge	R for Roget	Disbanded	-	62-68	-	-	-	-
F21	(Norrbottens Flygflottilj)	Lulea	U for Urban	JA/SF/SH37	-	-	-	69-84	N/A	-

Kongelige Danske Flyvevabnet (Royal Danish Air Force)—The service career of the *Draken* in Denmark, a NATO ally, has been solid if unspectacular. Denmark's order during 1968 calling for 20 F-35s (Danish serials A-001 to A-020) and three TF-35s (AT-151 to AT-153) marks the only occasion when the *Draken* has been ordered principally for the ground attack role. This was followed during 1969 by orders for 20 RF-35s (AR-101 to AR-120) and three more TF-35 trainers (AT-154 to AT-156), all 46 airframes being delivered during 1970 and 1971. Five additional TF-35s (AT-157 to AT-161) were purchased during 1973 and arrived in Denmark during 1976.

Eskadrille 725 (Esk. 725, or 725 Squadron) at Karup converted from North American F-100D *Super Sabres* and currently operates the F-35 in the ground attack role. Esk. 729, also at Karup, converted from Republic RF-84F *Thunderflashes* and still flies the RF-35 on day and night reconnaissance; in the latter capacity employing infrared system-equipped recce pods obtained during 1975. The TF-35 trainers are divided among these two *Eskadrillerne* of the *Flyvertaktisk Kommando* (Tactical Air Command). A program was underway during the mid-1980s to modify all Danish *Drakens* with new weapons aiming computers, radar warning receivers (RWR), and head-up displays (HUD). The *Draken* is expected to remain in Danish service until 1993.

Drakens known to have been struck off charge in Denmark include: A-015 (July 27, 1971); AR-103 (August 3, 1971); A-003 (September 9, 1974); A-013 (November 21, 1974); AR-101 (May 24, 1977); AT-159 (October 25, 1977); AT-161 (June 27, 1978); and A-016 (June 9, 1980).

Suomen Ilmavoimat (Finnish Air Force)—The service career of the *Draken* in this small air force (in accordance with the Treaty of Paris signed February 10, 1947, Finland is to remain nonaligned and is authorized only 60 combat aircraft including both Soviet and western types) is still being documented. Finnish *Drakens* have participated in several politically and historically significant events, not the least of which was the January, 1985, chase of a reported Soviet-launched cruise missile which penetrated Finnish airspace. On another occasion, Finnish *Drakens* also participated in the follow-up air search which resulted in the recovery of the wreckage of an SSN-N-6 *Sandbox* target drone out of a lake.

Finland's initial order for 12 SAAB-35XS fighters was placed on April 8, 1970, on terms which provided for much of the sub-contract work to be done locally and for Valmet OY to assemble these aircraft in Finland. The first Valmet-assembled *Draken* flew for the first time on March 12, 1974.

Pending delivery of these aircraft, which were designated J35S by the *Ilmavoimat* and given odd-numbered serials in the DK-201 to DK-223 range, training of an initial contingent of Finnish personnel was undertaken with *Flygflottilj* 18 (F18) at Tullinge in Sweden. Moreover, Finland initially leased and eventually purchased six ex-*Flygvapnet* J35Bs, these aircraft being designated J35BS by the *Ilmavoimat* and given even-numbered serials in the DK-202 to DK-212 range. The leased aircraft were the first to enter service, doing so during May, 1972, with *Havittajalentolaivue* 11 (HavLv-11, or 11 Squadron) in the *Hameen Lennosto* (the *Lennosto* or Wing, named after the Hame region of Finland) at Tikkakoshi. Within one year, this wing was relocated to Rovanieme—its current base near the Arctic Circle—and renamed *Lapin Lennosto* (Lapland Wing).

The first Finnish-built J35S to be delivered from Valmet was DK-201. It joined HavLV 11 at Rovaniemi on April 25, 1974.

Satisfied with its initial experience with the *Draken*, the *Ilmavoimat* has since placed two repeat orders for the Swedish fighter. During 1975, nine ex-*Flygvapnet* aircraft were ordered with six J35Fs becoming J35FSs in Finnish service (DK-26, DK-263, DK-265, DK-267, DK-269, and DK-271) and three Sk35Cs becoming J35CSs (DK-262, DK-264, DK-266). During 1983 and 1984, another batch of 20 secondhand J35Fs were ordered, these aircraft being intended to replace the Finnish assembled *Hawk Mk. 51s* of HavLV-21 in the *Satakunnan Lennosto* (Satakunta Wing) at Tampere and Pori. To keep the combat strength of the *Ilmavoimat* within its 60-aircraft limit, the *Hawks* will be used only for training, their currently assigned fighter-bombing role being taken over by *Drakens*.

The latest batch of *Drakens* ordered by the *Ilmavoimat* were overhauled to zero-time in Sweden and then shipped to Valmet, in Finland, for final modifications. The latter included the installation of Finnish communications and navigation equipment.

Following initial conversion training in F16 Sk35Cs, *Ilmavoimat* pilots were trained in the "new" aircraft during the fall of 1985. The type was declared operational during the spring of 1986.

Osterreichische Luftstreitkrafte (Austrian Air Force)—Since 1955, when Austria once again was allowed to have an air force, the *Luftstreitkrafte* has relied extensively on Swedish-built aircraft. Initially equipped with 30 secondhand SAAB J29Fs, the *1. Staffel* and *2. Staffel* (1st and 2nd Squadrons) of the *Uberwachungsgeschwader* (Surveillance Wing) at Zeltweg and Graz began their conversion to the SAAB 1050 during Janury, 1970. However, roughly being equivalent to the similarly powered Cessna A-37B, the SAAB 1050 was found to lack the radar and performance (its top speed being 603 mph/970 kmh) necessary for the air intercept role.

For many years, plans to acquire genuine interceptors were nurtured by Austria but lack of funds and a desire not to antagonize the Soviet Union long frustrated this ambition. After looking at a variety of new and secondhand aircraft—including the British Aerospace *Lightning*, the Dassault *Mirage III*, the Israel Aircraft Industries *Kfir*, the Northrop F-5E, and the SAAB *Draken* and *Viggen*—the 14 year search finally ended on April 2, 1985, when Austria's Council of Ministers approved the acquisition of 24 ex-*Flygvapen* J35Ds. Once refurbished by SAAB, with certain items of Swedish equipment being removed, these *Drakens* will enable the *Luftstreitkrafte* at last to join the ranks of air forces flying supersonic fighters.

Initial conversion training for the Austrian pilots was undertaken during the late fall of 1985 at F16, Uppsala, near Stockholm. This activity later was transferred to F10, Angelholm, where several of the remaining *Draken* squadrons were located.

The first of the refurbished *Drakens* for Austria, now known as J35Ö, was scheduled to have been delivered to Austria during May, 1987. Interestingly, during an April, 1987, test flight from Linkoping, a navigation error caused the first J35Ö accidentally to stray into Soviet airspace. Though an attempt to intercept the aircraft was made by two Sukhoi Su-15s of the Soviet Air Force, it escaped into Swedish airspace without being found.

CONSTRUCTION AND SYSTEMS:

The following description applies specifically to the J35F and SAAB 35X configurations:

Of all metal-construction (with some bonding) and double delta configuration, the J35 is a single-seat all-weather supersonic interceptor, with secondary ground attack capability. It is capable of 8 g maneuvers (though it has been structurally tested to some 20 gs). Service time per flight hour presently is assessed at 20 hours.

Fuselage—The fuselage is designed integral with the center wing section and is built as a light metal stressed-skin structure. From the front, rearwards, it accommodates the radar, a pressurized and air-conditioned cockpit, the nose landing gear, several avionics and miscellaneous equipment compartments, fuel tanks, armament, the main landing gear, the powerplant, and a retractable twin-wheel tail wheel.

The fuselage is built up of two main sections (front and rear), and a series of smaller assemblies such as the radome, the rearward-hinged canopy (the two-seat configuration has a canopy that is hinged to the right side of the aircraft), the dorsal spine, the tail cone, the air intakes, and the landing gear doors. The fuselage front and rear sections are bolted together and thus can be separated. The rear section, which besides the actual fusleage part also consists of the rear section of the center wing, houses the engine with afterburner, the fuel tanks, part of the armament complement, the main landing gear, and miscellaneous equipment. Underneath the rear fuselage section there are attachment points for external armament racks or a drop tank. The tail cone, housing the rear section of the afterburner, is joined to the rear fuselage section by means of 4 quick-action locks. The vertical fin assembly is bolted to the fuselage and center wing and between the center wing and outer wing panels. On top of the fuselage, where protection from small arms fire is greatest, there is a dorsal spine running from the canopy rearwards past the fin. This forms a tunnel for cables and pipes and has several detachable sections. The spine also contains inlets and outlets for cooling air, and its rear section accommodates a compartment for the drag chute at the base of the rudder.

The cockpit is equipped with an ejection seat of SAAB design. The SAAB 35X is specifically equipped with the fully automatic SAAB 73SE-F rocket-assisted seat and associated GQ parachute system. This unit is capable of safe emergency egress throughout most of the SAAB 35's envelope down to 62 mph (54 knots) at zero altitude.

The vertically adjustable seat has special leg supports and an energy absorbing head rest. The back of the seat houses the parachute and survival pack including its own emergency oxygen supply. In case of a belly landing, the seat has effective impact damping.

The cockpit layout is optimized for crew member comfort. The cockpit has a clean layout with basic instrumentation grouped around the central radar scope. Emergency instruments, communication, autopilot, aircraft and radar controls are placed on the left side. The right side contains warning panels, navigation, weapons, fire control, circuit breakers, and other systems panels. The ejection seat and the pedal distances allow instant inflight seating adjustments. Efficient air conditioning supplements the moderately pressurized cockpit as well as the pressurized radar compartment.

Wing—The wing is of the cantilever mid-wing monoplane type in double delta configuration. The leading edge sweepback angle on the inboard section is 80° and on the outboard section, 57°. The thickness/chord ratio is 5%. The inboard section is of all-metal stressed-skin structure and consists of the outer wing assemblies and the wing tips. The outer wing panels are removable for road transport, bringing down the aircraft width to 14.42 ft. (4.40 m.).

Control System—The control system consists of a pair of elevons attached to each wing trailing edge (an inboard and an outboard surface with the outboard surfaces being mass balanced) and a rudder mounted on the vertical fin trailing edge. All moving surfaces are servo powered (by two actuators per surface) and integrated with a three-axis automatic flight control system. The latter includes yaw damping, course holding, and pitch damping capabilities. During manually controlled flight, control forces are fed to the elevon and rudder servo systems by means of cables, so that they transmit only the movement and power required for operation of the servo valves. The stick and rudder pedals are equipped with a synthetic feel unit. No control surface forces are fed back to the stick or pedals, but the necessary forces for the pilot are synthetically generated by a speed and acceleration sensing device.

Landing Gear—The landing gear, which are arranged to leave most of the undersurface of the aircraft available for external load mounting, consists of a conventional, steerable (by cockpit-mounted tiller wheel), forward retracting nose gear, a conventional outward retracting main gear, and a rearward retracting tail wheel assembly. To reduce internal volumetric space requirements, the main gear legs are hydraulically shortened during retraction, with hydraulic fluid being stored in a separate reservoir as it is removed. The nose gear tire is inflated to 142/185 lbs. sq. in. and the main gear tires are inflated to 171/242 lbs. sq. in. The main gear wheels are equipped with single disc Goodyear (some older SAAB 35 series aircraft had double-disc) brakes and also are provided with a Dunlop anti-skid system. To assist in braking, a drag chute is fairing-mounted below the rudder and two pairs of hydraulically actuated airbrakes are hinge-attached to the fuselage empennage section near the wing trailing edge. An arresting hook is optional.

With the advent of the Swedish-designed afterburner (see text concerning SAAB 35 development), and the associated empennage extension, SAAB felt that it was necessary to equip the aircraft with a tailwheel assembly to prevent damage during rotation for takeoff and over-rotation during landing. This was particularly important in consideration of the short field requirements outlined in the original operational specification. The resulting tailwheel assembly is hydraulically retractable into its own well in concert with the main landing gear, it is non-swiveling, and the tires are hard rubber.

Hydraulics—Hydraulics are duplicated in two completely self-contained and independent systems. Each of these systems is capable of operating at maximum effective power and thus capable of powering all associated systems. Each system features its own engine-driven hydraulic pump. One system provides power for operation of the main landing gear, the nose wheel, the tail wheel assembly, the control servo system, and the airbrakes; the other also services the control system and is integrated with a back-up hydraulic system that is connected to the pop-out ram air turbine (that permits control system operation in an emergency situation).

Electrical System—The electrical system consists of both AC and DC systems. The AC system supplies 200/115V 400 Hz power via a 20k VA engine-driven

A J35D of F3 Wing with two empty T53 pylons attached to the fuselage underside. These normally serve to accommodate fuel tanks or rocket pods. Visible under the wing leading edges are wing fences which are standard on all "Draken" variants.

SAAB via Göran Henriksson

John Charleville via Göran Henriksson

Two J35Ds (including 35305, front) of F4 Wing being prepared for a practice mission. Upper wing surface markings, consisting of a solid white diamond, are noteworthy. Visible under the wings are pylons for Rb24 "Sidewinder" missiles.

Björn Karlsson

A J35F² of F10 Wing moments before touchdown. Visible are extended empennage-mounted airbrake, extended tailwheel, and typical "Draken" nose-high landing attitude. A single 1,275 liter drop tank is visible under the fuselage.

generator or, in an emergency, via a 3.5kVA generator in an emergency power unit. Equipment requiring DC power is fed from these AC systems via two rectifiers giving 2.2kW at 29V. One 24V 22Ah accumulator acts as a buffer. Power from this system is available for three engine start attempts. The electrical cables are arranged in different groupings dependent on imposed grounding, shielding, and twisting requirements. This has virtually eliminated interference effects and also facilitates changes of equipment types. Ground connections are provided for AC, DC, and telephone.

Armament and Electronics—As originally configured for the J35F, the electronics package consists of a high-capacity data link system integrating the aircraft with the Digitrac-optimized STRIL 60 semi-automatic air defense control system, the SAAB FH 5 flight control system (autopilot) with an Arenco Electronics air data system, stick steering and various following modes, and the SAAB S7B collision-course fire control system which has been modified for compatibility with the Rb.27 and Rb.28 air-to-air missiles. The Ericsson PS01/A search and ranging radar with horizon-stabilized scan program and a Hughes-manufactured infrared sensing unit (similar to that found on the Convair F-102) also are integrated with the S7B. An integrated radar unit manufactured by Philips Teleindustri and known as the PN-594/A and PN-793/A, serve to accommodate navigational requirements. The data converter for these systems has been developed by Standard Radio & Telefon and AGA supplies the Fr 17 VHF communications radio, the Fr 16 stand-by VHF (in some aircraft this is apparently supplied by Collins), the Fr 15 DME navigational aid, and miscellaneous equipment.

Additionally, it is known that various models of the SAAB 35 are equipped with IFF, radar homing and warning, and countermeasures systems. For obvious reasons, specific information pertaining to these systems has not been released.

Powerplant—Various J35 configurations, as outlined in the "variants" section, have been powered by different versions of the same basic Rolls Royce *Avon* series engine built under license by Volvo Flygmotor under the RM6 designator. The engine used on the J35D, the S35E, and the J35F is specifically the RM6C, which is a developed version of the *Avon* known as the -300, or RB.146 (which is, itself, a developed version of the Rolls Royce RA.24). It is equipped with a Swedish-developed Model 67 afterburner.

The engine is fed by a fixed-geometry bifurcated inlet that is optimized for simplicity and acceleration rather than very high supersonic speed. Interaction with the nose shockwave, however, still allows the aircraft to obtain speeds slightly in excess of Mach 2.

The RM6C intake consists of a magnesium annular casing with variable incidence (hydraulically-actuated) inlet guide vanes. All forward-facing surfaces have compressor bleed anti-icing. The compressor is a 16-stage axial unit with rotor blades pinned to the rotor discs, which in turn, are splined to a shaft. Both the stator and rotor blades are of aluminum alloys. The compressor shaft is both roller and ball bearing mounted. The front compressor casing in cast magnesium alloy carries the stage 0 through 6 stators; the intermediate casing in aluminum alloy carries the stage 7 through 9 stators, and the fabricated steel outlet casing carries the stage 10 through 15 stators while also having eight webs providing the ducting required to direct air to the combustion chambers. The webs are hollow and collect hot compressor air for anti-icing and aircraft services.

Eight flame tubes are mounted within the annular chamber, each fitted with duplex burners. There are interconnecting pipes between each pair of flame tubes.

The nozzle casing, of cast chrome steel, has two rows of guide vanes with one being mounted ahead of each turbine stage. The turbine is a two-stage design with the turbine shaft being coupled to the compressor shaft. High pressure and low pressure blades are both of Nimonic alloys. All turbine blades are shrouded at their tips.

Accessory drives for the lubrication, fuel pumps, and electrical power equipment consist of two horizontal power takeoff shafts with one on each side of the engine. They are driven by gearing on the main shaft, just aft of the center bearing assembly.

The lubrication system with its four scavange pumps is of the closed circuit type with lubrication being provided for the three main bearings, the starter reduction gear, and the ancillary drive systems.

The RM6C is started by a Plessey iso-propylnitrate fluid starter mounted in the intake bullet. The starter fluid tank has a capacity for three starts. This is integrated with an automatic high-energy ignition system. A related torch ignition system for the afterburner also is automatically controlled.

The Swedish-designed and manufactured afterburner has an infinitely variable flap-type nozzle driven by screw-jacks. It has V-type flame-holders with the fuel injection manifold situated at the front of the V. Afterburner fuel flow is regulated at the pump outlet by a regulator which ensures a constant pressure ratio over the engine turbine.

Quick-action couplings, access doors, a built-in arrangement for an engine dolly, etc. have been designed to shorten the time required for engine changes and overhaul.

The engine and afterburner are enclosed by the fuselage rear section and the tail cone, which both have access doors for inspection. The engine compartment has separately ventilated zones, and the afterburner is separated from the other zones by a radiation shield and a fire wall. An engine fire warning system also is installed, and is connected to warning lights in the cockpit. Fire extinguishing is provided for the afterburner pump compartment.

Fuel for the J35F is carried in integral tanks in both the fuselage and inboard wing sections. Total internal fuel capacity is 880 Imp. gals. (4,000 liters). Provision for external, jettisonable tanks (either 300 liter, 500 liter, or 1,275 liter capacity) under the fuselage and wings increases the total fuel capacity to a maximum of 1,980 Imp. gals. (9,000 liters). Additional internal tanks can be fitted for ferry purposes. Fuel type is equivalent to NATO-standard JP-1 or JP-4. Ground refueling is accomplished through a fuselage-mounted single-point pressure refueling system with a capacity of 220 US (185 Imp.) gals. per minute. A fuel balance system reduces center of gravity travel and the fuel gauging system is of the capacitive type that compensates for fuel specific gravity variations.

Basic engine length is 138 inches (8,140 mm) and basic engine diameter is 44 inches (1,117.6 mm). Weight with afterburner attached is 3,902 lbs. (1,770 kg.). Specific fuel consumption in afterburner is 1.85 (kg/kph), and maximum outlet temperature while operating in afterburner is 750° C.

	w/o a/b	w a/b
RM6B (RB.146 series 200)	11,245 lbs. th.	15,190 lbs. th.
RM6C (RB.146 series 300)	12,456 lbs. th.	17,086 lbs. th.

All specifications are at zero speed and altitude and under standard atmosphere conditions.

SPECIFICATIONS AND PERFORMANCE:

	SAAB 210/A/B	J35A	J35F
Length (ft./m.)	28.87/8.80	46.1/14.02	50.33/15.35
Wingspan (ft./m.)	20.83/6.35	30.85/6.35	30.85/6.35
Wing area (sq. ft./m.)	260.5/24.2 (210A) 248/23 (210B)	529.6/49.2	529.6/49.2
Height (ft./m.)	9.12/2.78	12.75/3.89	12.75/3.89
Empty weight (lbs./kg.)	?	15,994/7,255	16,369/7,425
Gross weight (lbs./kg.)	3,913/1,775 est.	27,000/12,446	27,998/12,700
Max. speed (mph/kmh)	345/555	1,000/1,609 M1.6 @ 36,090 ft.	1,320/2,125 M2.0 @ 36,090 ft.
Max. rate of climb (ft./meters per min.)	1,640/529	22,000/6,706	39,370/12,000
Service ceiling	?	55,000/16,275	67,000/20,420
Range (mi/km)	?	900/1,450	1,200/1,930

ARMAMENT AND STORES:

J35A/B: Standard armament complement included two 30 mm Aden M-55 cannon with 90 rounds per gun and provision for four Rb.24 *Sidewinder* infrared homing air-to-air missiles. Additionally, various combinations of free-fall iron bombs could be carried for ground support missions.

J35F: Standard armament complement included one 30 mm Aden M-55 cannon with 100 rounds and provision for two Rb.27 radar homing air-to-air missiles, and two Rb.28 infrared homing air-to-air missiles.

It should be noted that the *Draken* is equipped to carry the *Red Baron* night reconnaissance pod and a related centerline reconnaissance pod weighing 705 lbs. (320 kg.). The latter, which provides 120° stereo coverage across the line of flight at an altitude of 300 ft. (100 m.) and a speed of 630 kts (725 mph; 1,167 kmh), has been ordered for the S35E. Equipment in these pods, of which 20 originally were ordered, includes three synchronized 70 mm Vinten cameras with infrared-corrected lenses and a 10kVA EG & G electronic flash system. This pod is optimized for night and low-level reconnaissance.

SERIAL NUMBERS:

	Serial Nos.	Quantity New A/C	Quantity Converted A/C
SWEDEN:			
Prototypes	35-1 to 35-3	3	
J35A	35001 to 35090	90	
J35B	35201 to 35289		89
Sk35C proto.	35800	1	
Sk35C	35801 to 35825		(25)
J35D	35301 to 35393	93	
S35E	35901 to 35932	32	
	35960	1	
	35933 to 35959		(27)
J35F	35401 to 35608	208	
	sub-total, Sweden	517	(52)
AUSTRIA:			
J35F	not known		(24)
	sub-total, Austria		(24)

	Serial Nos.	Quantity New A/C	Quantity Converted A/C
DENMARK:			
F-35	A-001 to A-020	20	
RF-35	AR-101 to AR-120	20	
TF-35	AT-151 to AT-161	11	
	sub-total, Denmark	51	
FINLAND:			
J35S	DK-201, DK-203, DK-205, DK-207, DK-209, DK-211, DK-213, DK-215, DK-217, DK-221, DK-223	12	
J35Bs	DK-202, DK-204, DK-206, DK-208, DK-210, DK-212		(6)
J35FS	DK-261, DK-263, DK-265, DK-267, DK-269, DK-271		(6)

	Serial Nos.	Quantity New A/C	Quantity Converted A/C
J35S (*Flyg.* ser. Nos.)	35462, 35487, 35417, 35447, 35458, 35431, 35455, 35451, 35446, 34452, 35499, 35425, 35452, 35444, 35448, 35483		(18)
J35CS	DK-262, DK-264, DK-266, DK-268, DK-270		(5)
	sub-total, Finland	12	(35)
GRAND TOTAL			580

AVAILABLE SCALE MODELS AND DECALS:

Kits

Adams: 1/51
Airfix: 1/72
EKO: 1/50
KVZ: 1/100
Lindbergh: 1/51
Plasticart: 1/100
Revell: 1/71
Tamiya: 1/100

Decals

No decal sheets are known to have been released as of the date of this publication.

Göran Henriksson

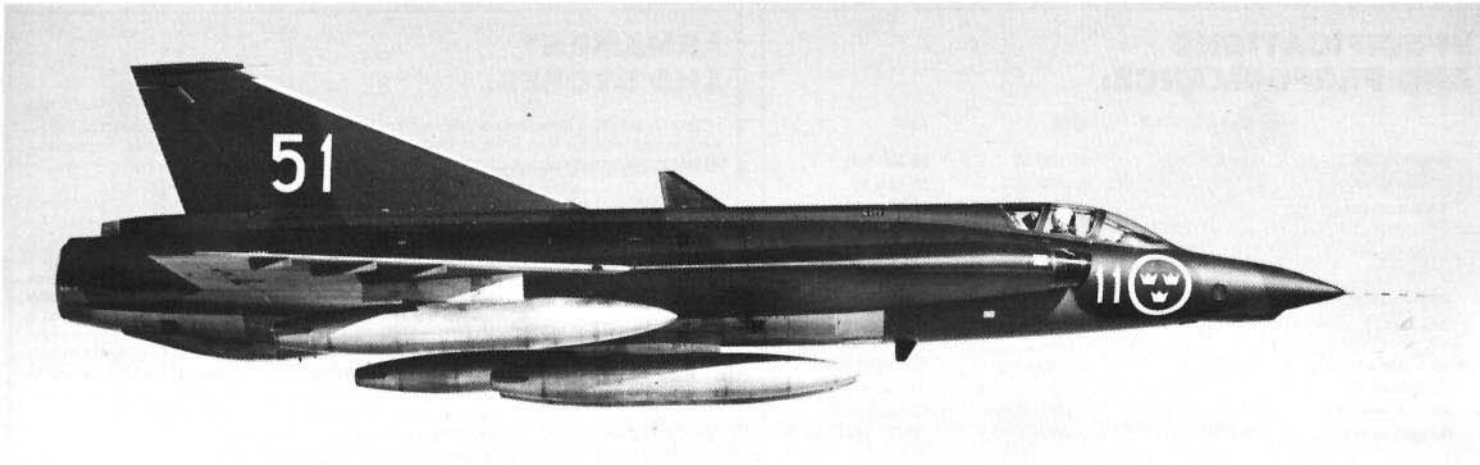
A J35F² of F10 Wing during refueling. The J35F, like the J35D, was equipped with a revised intake configuration with an extended lip. This accommodated the mass flow requirements of the more powerful RM6C turbojet engine. The single-point pressure refueling system has a capacity of 220 US gpm.

Göran Henriksson

A J35F² of F10 on final approach. Barely visible are the extended bottom fuselage airbrakes. The aircraft is carrying a pair of 1,275 liter drop tanks, but otherwise is clean. Drop tanks usually are left natural metal.

Tommy Lakmaker via Göran Henriksson

A J35F² of F10 on September 7, 1985. The aircraft bears unusual unit markings on vertical fin and somewhat larger than normal national insigne on forward fuselage. Visible under the wing is a single pylon for an Rb24 "Sidewinder".



SAAB via Göran Henriksson

Carrying two 1,275 liter centerline drop tanks and two 500 liter wing drop tanks, S35E, 35951, of F11 cruises at low altitude over the Swedish countryside. The distinctive reconnaissance-configured nose of the S35E, with its various camera ports, is apparent in this view. Not so apparent are the two small ports for the wing-mounted cameras. Noteworthy is the distinctive VHF communications antenna on the fuselage underside, just ahead of the drop tanks.

Peter Liander

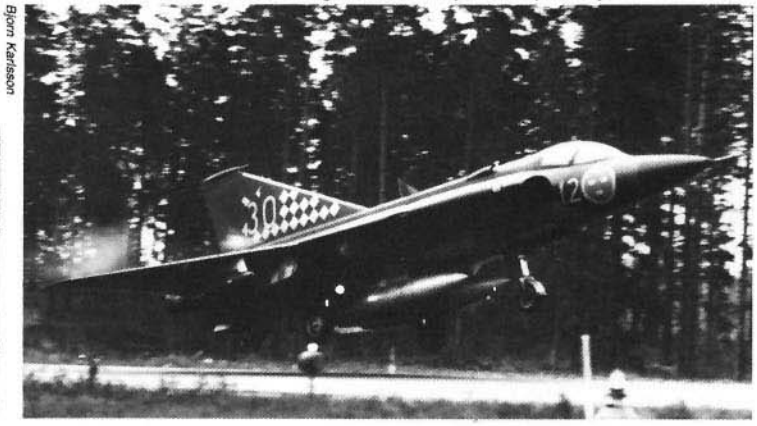
The latest "Draken" variant to enter the "Flygvapen" inventory is the J35J. One of the first J35Js, 35619, recently assigned to F10 Wing, is seen carrying Rb24 "Sidewinders" on its forward wing pylons during a practice mission.

Göran Henriksson collection

Taxiing down a back-country road to its temporary field base, an S35E of F11 returns from a mission. Such field operations are quite common and regularly demonstrate the "Draken's" designed-in versatility and adapatability.

Björn Karlsson

A J35F[1] of F12 Wing. The bulged canopy of this model provided improved headroom and improved rearward vision for the pilot. The J35F is equipped with an Ericsson PS-01 or -01/A radar (superceding the older PS-03 of earlier "Drakens").



Björn Karlsson

A J35F[1] of F12 Wing moments before touchdown. The vertical fin diamond pattern, in several different forms, has been used regularly by several different "Flygvapnet" Wings. F12 also has used a checkerboard pattern on wing lower surfaces.

Göran Henriksson

The first J35 deliveries were made to F13 Wing at Nörkoping during March, 1960. Nineteen of the original J35As delivered to F13 for service test and evaluation are visible in this view. Noteworthy is the J35A's distinctive short tailcone.

SAAB via Göran Henriksson

J35A, 35012, of F13 Wing, shortly after the type first entered the "Flygvapen" inventory. Short tailcone is particularly prominent in this view. Also discernible was the tail skid which later was replaced by a retractable tailwheel unit.

Göran Henriksson collection

Carrying no less than two Rb27 and two Rb28 (inboard and outboard, respectively) "Falcon" air-to-air missiles, a J35F[1] of F13 is seen during a vertical intercept maneuver. The aircraft was fully capable of supersonic speeds with this payload.

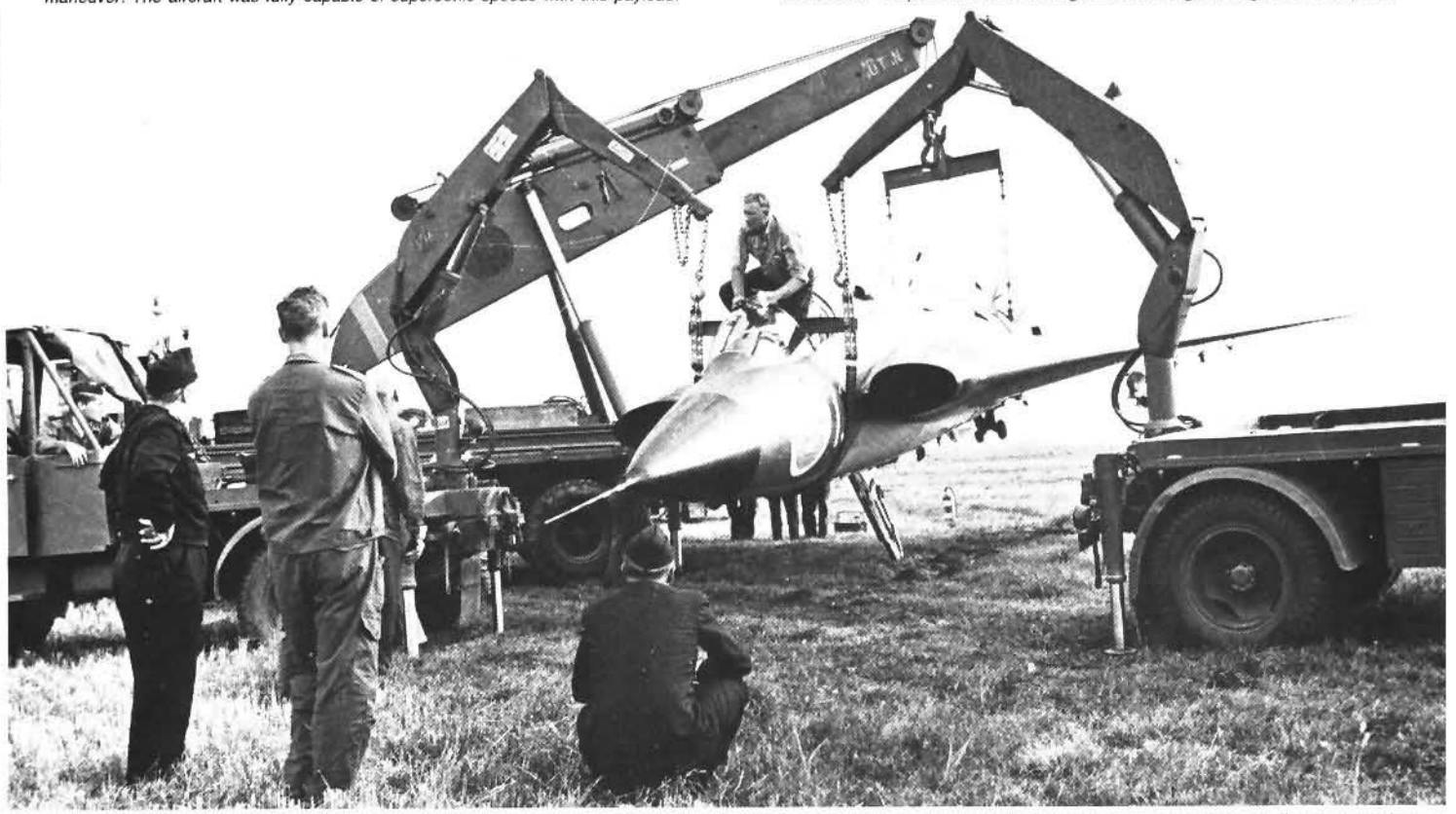
Göran Henriksson collection

Updated J35A, 35077, of F13 Wing during roll-out following touchdown. Noteworthy is compressed position of load-bearing tailwheel and nominal clearances of tailwheel well doors. The J35A was used primarily as a trainer by F-13, following its introduction.

SAAB via Göran Henriksson

A J35F[2], of F13 Wing, carrying two Rb27 and two Rb28 air-to-air missiles. The Rb28 is equipped with an infrared seeker head and the Rb27 with a semi-active radar tracking head. Both weapons are total redesigns of their original Hughes counterparts.

Göran Henriksson collection



The "Draken", because of its modular design, is a relatively easy aircraft to repair. This J35F[1], of F13 Wing, is being raised by hydraulic lifts so that the landing gear can be manually extended following an emergency belly landing during 1968. Damage was minor and the aircraft was flying within a month. The SAAB engineering staff was particularly sensitive to the difficulties of field maintenance and the "Draken" has benefitted greatly from this foresight over the many years it has been in service.

SAAB via Göran Henriksson

The Sk35C trainer first was assigned to the F16 Wing at Uppsala and used for "Draken" training programs. The distinctive short tail of the Sk35C is apparent in this view of four F16 Wing aircraft (including 35807 and 35819) in formation.

Göran Henriksson collection

Following initial deliveries of the J35A to F13, F16 became the second wing to receive the "Draken" when an initial batch arrived during late-1960. The updated J35As pictured were part of the F16 Wing aerobatic team that performed during the mid-1960s.

Göran Henriksson collection

An early Sk35C, 35802, of F16 Wing's conversion unit. Absence of the ubiquitous back seat periscope is noteworthy. Most Sk35Cs remained bare-metal throughout their operational careers. Large vertical fin numbers were standard for this model.

Göran Henriksson

An F16 Wing Sk35C, possibly 35820, prepares for takeoff at Uppsala during September, 1970. The aircraft is equipped with a single 1,275 liter centerline fuel tank. Visible under the left wing is one of the ventral fins found on all two-seat "Drakens".

Peter Liander

A J35F[1], 35479, of F16 Wing, while rolling-out following landing at Uppsala during September, 1984. Extended upper fuselage airbrake is noteworthy, as is what appears to be a communications antenna to the rear of the drop tanks.

Göran Henriksson collection

A J35F[1] of F16 which was involved with another "Draken" in a mid-air collision over the Baltic Sea on February 23, 1982. This aircraft, though severely damaged, was able to return, but the other "Draken" was lost with pilot.

Björn Karlsson

A modified J35A of F16 Wing. It is equipped with a single 500 liter centerline drop tank. This aircraft, like the majority of J35As built, was used as a trainer and transition aircraft to familiarize pilots with the "Draken's" unique flight characteristics.

Göran Henriksson

A J35F[2] of F17 Wing is prepared for an engine run inside an engine test cell. The acoustically attenuated test cell is designed to permit full-power engine run-ups with the aircraft in static position. Noteworthy are the FOD guards on the intakes.

Göran Henriksson

A J35F² of F17 during 1974. The aircraft infrared sensor is covered, but otherwise it appears flightworthy. Visible on the main gear well doors are part of the checkerboard markings found on the wing undersurface of F17 aircraft.

Göran Henriksson collection

Underground hangars are fairly common in the "Flygvapen". F18 Wing J35Bs, which represent some of the earliest operational "Drakens", are seen in their protective shelter, ready for rapid deployment on short notice.

Rolf Larsson via Göran Henriksson

J35F¹ of F18 Wing, Tullinge, on June 30, 1985. This aircraft was painted gloss red over-all, with white drop tanks, in preparation for the last flight of the last "Draken" squadron at F18. The wing subsequently was disbanded.

Göran Henriksson collection

An F18 Wing updated J35B during roll-out. The deployed drag chute is a ring-slot type. The drag chute commonly is used on the "Draken" to shorten landing roll-out on the back-country roads often used during practice operational sorties.

SAAB via Göran Henriksson

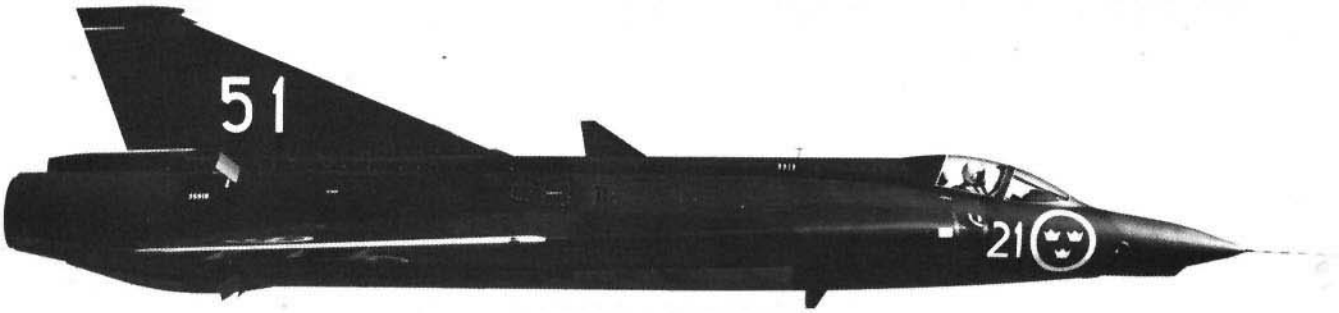
An F18 Wing J35F at the moment of touchdown on a Swedish back-country road base. Well-defined piloting skills are required for such narrow landing and takeoff strips. The "Draken's" landing gear were designed to accommodate Swedish road dimensions.

Göran Henriksson

J35B, 35220, of F18 at Tullinge, wearing an experimental splinter-type ("Viggen") camouflage. Consisting of chocolate brown, tan, medium green, and dark green, it never was adopted for use on the "Draken" in "Flygvapnet" service.

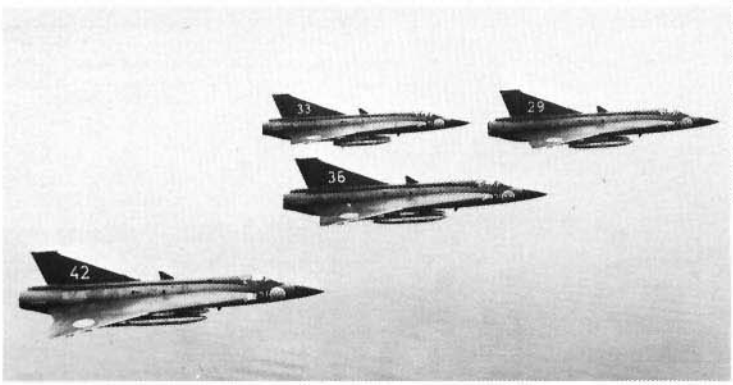
Björn Karlsson

Two J35Ds of F21 Wing during takeoff. The J35D was the first production "Draken" variant truly capable of Mach 2 in level flight. This was made possible by the incorporation of the RM6C powerplant, which was substantially more powerful than its predecessor, the RM6B. The RM6C, with its indigenously developed Model 66 afterburner (substantially better than its British stablemate) generally was rated at approximately 17,650 lbs. th. When properly "tweeked", production RM6Cs often generated over 18,000 lbs. th.



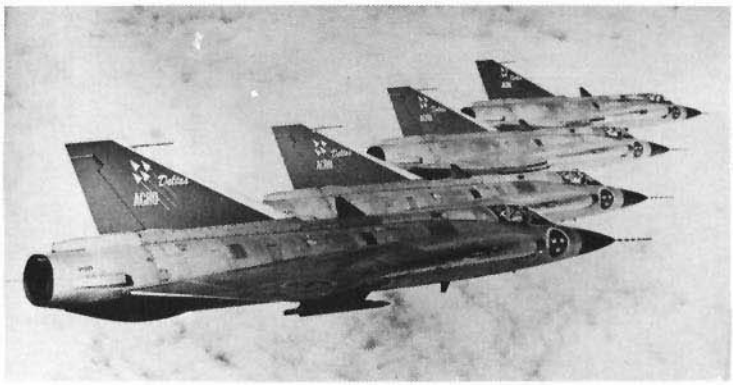
SAAB via Göran Henriksson

S35E, 35919, of F21 Wing. Clean design of the basic "Draken" family is apparent. Noteworthy are the extended airbrakes, not often photographed in use in flight. The S35E basically was a modified F35D with accommodations for optical sensors. The latter were acquired from OMERA in France. Nine years after the type's introduction, however, the "Flygvapen" ordered British-manufactured Vinten cameras for night and low-level work, these providing 120° coverage at 330 ft. and 630 knots.



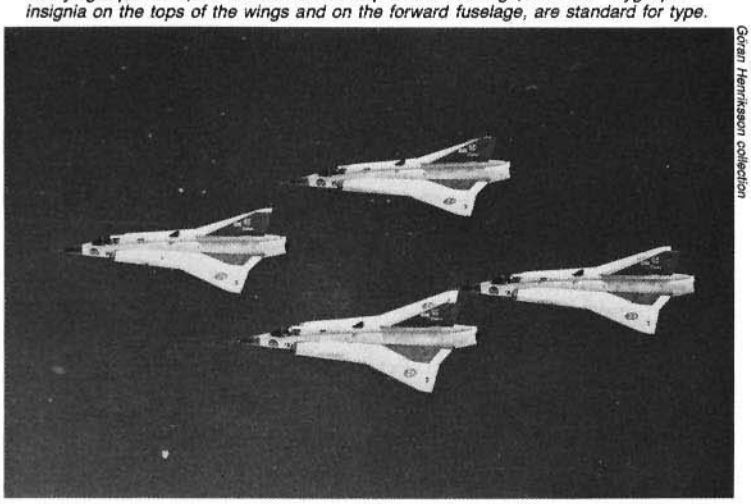
Jiver Blixt via Göran Henriksson

Four J35Ds of F21 Wing in formation over the Baltic Sea. All four aircraft are each carrying a pair of 1,275 liter centerline drop tanks. Markings, with the "Flygvapen" insignia on the tops of the wings and on the forward fuselage, are standard for type.



Göran Henriksson collection

Under the auspices of F18 Wing, the "Flygvapen" sponsored an aerobatic team called the "Acro Deltas". With their bright red tails (and white lettering), the four J35Bs often were seen at airshows and displays, promoting Swedish military air service.



Göran Henriksson collection

Aerobatic work with F18's "Acro Deltas" later was followed by a similar aerobatic team under the auspices of F16. The aircraft used by the "Acro Delta" included 35223, and 35263. Modifications incorporated smoke oil tanks and lines.

Björn Karlsson

A J35F[1], of the FC Test Wing carrying two Rb27s (inboard) and two Rb28s (outboard). though of the same family, the Rb27 and Rb28 are essentially two different types of air-to-air weapon. The Rb28 utilizes infrared homing, and the Rb27, radar.

Chris Pocock

An FC Test Wing J35F, serving as the J35J prototype at Angelholm, during September, 1985. It is armed with a dummy ("Blind") late-model Rb24 "Sidewinder" (similar to an AIM-9J) on a J35J-type forward delta underwing pylon, and what appears to be a centerline-mount camera pod for documenting missile test firings. A 500 liter wing drop tank is dolly-mounted under the left wing. The aircraft bears F10 tail markings but is assigned to the FC Test Wing.

Chris Pocock

Another view of the J35F² which has served as the J35J prototype. The distinctive Rb24 inboard, forward delta wing pylons are apparent. Visible under the fuselage and attached to a centerline pylon is a special camera pod for missile documentation.

Göran Henriksson collection

The prototype J35XD at the moment of touchdown. This aircraft has several unusual modifications, including an unidentified centerline container/fairing, an extended test pitot boom, and a non-standard dorsal antenna of the "towel rack" variety.

SAAB via Göran Henriksson

The second, third, and fourth J35XDs (A-002, A-003, and A-004, respectively) during their delivery flight on September 1, 1970. The aircraft are clean, with no external stores or drop tanks. Overall scheme is flat, dark green.

SAAB

The second Danish "Draken", J35XD A-002, during a pre-delivery test flight and while carrying four 500 lb. iron bombs and two 1,275 liter centerline drop tanks. The absence of the "Draken's" distinctive auxiliary vertical fin is noteworthy.

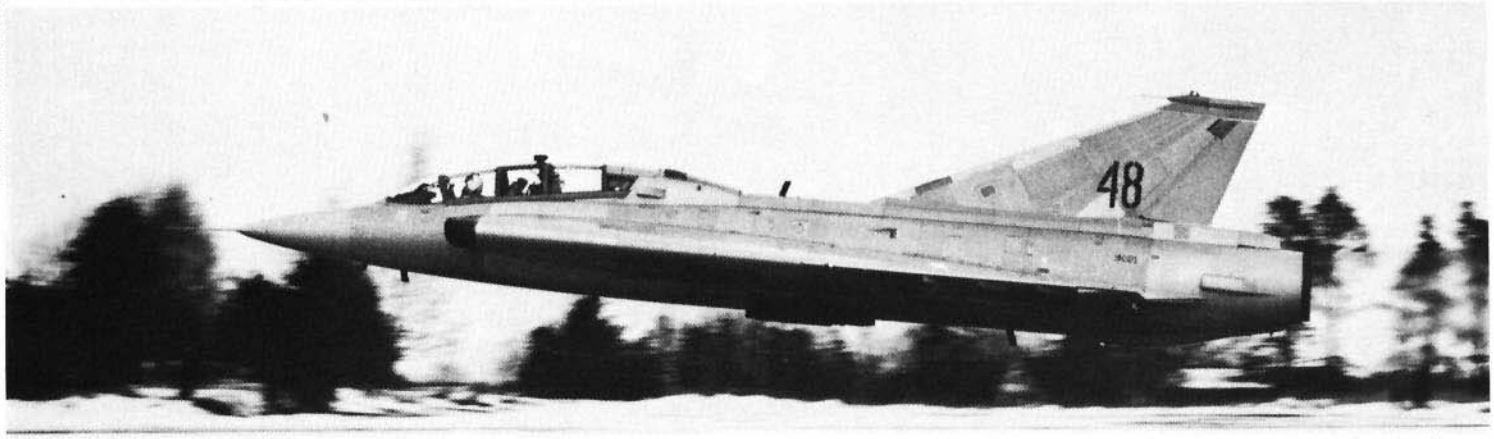
SAAB

AR-108 was the eighth RF-35 reconnaissance "Draken" delivered to Denmark. This aircraft was virtually identical to the S35E delivered to the "Flygvapen" with the exception of having functional gun bays in the wings.

Chris Pocock

Parked outside its domed shelter, AR-106, the sixth RF-35 delivered to Denmark, sits on alert. Visible is the wing gun port distinguishing this variant from its S35E Swedish counterpart. Norteworthy are the six underwing stores pylons.

SAAB via Göran Henriksson



An unidentified Danish TF-35 two-seat "Draken" trainer, bearing the barely legible tail number of "9001" (possibly implying that it is AT-151, the prototype for the Danish trainer series), is seen during a test hop out of Linköping. The bare-metal scheme later would be replaced by the standard Danish dark green over-all camouflage, black and red lettering, and national insignia. Eleven TF-35 trainers were delivered to Denmark by SAAB, these complementing the twenty fighter and twenty reconnaissance models also ordered.

Göran Henriksson

Danish TF-35, AT-157, departing Linköping. At this early stage of the type's introduction into Danish service, it still was painted in a gloss-green finish, rather than the later matte, or flat surface finish. Additionally, the camouflage was one color.

SAAB via Göran Henriksson

AT-157 during a test hop out of Linköping and prior to delivery. Numerous differences between the TF-35 and Swedish Sk35C exist, including the absence of wing-mounted ventral fins and the addition of various small communications antennas.

SAAB

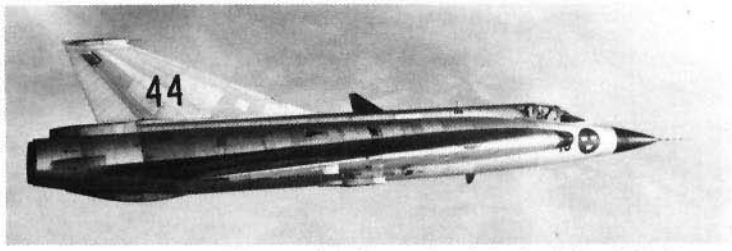
The first of an initial batch of twelve "Suomen Ilmavoimat" (Finnish Air Force) J35Ss assembled in Finland, DK-201. This aircraft was followed into service by a batch of leased J35Bs referred to in-country as J35BSs.

SAAB

An initial delivery of six refurbished J35Bs, as J35BSs, entered the Finnish Air Force inventory during May, 1972, and were used as transition trainers until the arrival of the first Finnish-built (Valmet) J35Ss during 1974.

SAAB via Göran Henriksson

J35BS, DK-202, was the first of the refurbished J35Bs delivered to the "Suomen Ilmavoimat" during 1972. Modifications were minimal, though a new antenna configuration is visible on top of the fuselage, along with a new vertical fin tip.



SAAB via Göran Henriksson

Twenty-four early ex-"Flygvapen" J35Ds were bought by the "Osterreichische Luftstreitkrafte" (Austrian Air Force) during April, 1965. These aircraft are undergoing a major modification and improvement program and will be delivered as J35Ös.

SAAB

The first J35Ö for the Austrian Air Force, prior to delivery during May, 1987. Though J35D airframes, the J35Ös are equipped with J35F canopies. Most of the J35Ös initially served with the "Flygvapen's" F4 wing. Final J35Ö deliveries to the Austrians are to take place during 1989. Armament includes two 30mm Aden cannon and four Rb24 AAMs. J35Os will equip the "Uberwachungsgeschwader" (Surveillance Wing), eventually being divided between the two "staffeln" of II Regiment at Zeltweg and Graz-Thalerhof.

Tommy Lakmaker

J35F[1], 35435, of F16 Wing during June, 1986. An all-white Rb.27 radar-guided air-to-air missile is attached to the inboard pylon of the right wing. The outboard wing pylon station is equipped to accommodate fin-stabilized Bofors rockets. Attached to the centerline pylons are a pair of 1,275 liter drop tanks. Dark blue-grey and dark green upper surface with light blue-grey undersurface markings for this aircraft are representative of the standard "Flygvapen" scheme presently in use.

Jens Schmidtgen

J35F[2], tail code 13, of F10 Wing at Angelholm during September, 1985. Attached to the centerline pylons are a pair of 1,275 liter drop tanks. Dark blue-grey and dark green upper surface with light blue-grey undersurface markings for this aircraft are standard for type in "Flygvapnet" service. Drop tanks usually are left natural metal. The wing and fin leading edges also usually are left natural metal. Common on "Flygvapnet Drakens" are white numbers or symbols painted on the upper wing surfaces.

Jens Schmidtgen

J35F[2], 35519, of the FC test wing during September, 1985, at Angelholm. Orange nose band is noteworthy. Dark blue-grey and dark green upper surface with light blue-grey undersurface markings for this aircraft are standard for type in "Flygvapen" service. Wing badge is visible on vertical fin. This aircraft has no upper surface wing marks. As with most stock "Draken" color schemes of this type, the wing and vertical fin leading edges have been left natural metal.

Jens Schmidtgen

Sk35C, 35821, of F16 Wing during August, 1985, at Karlsborg. Distinctive short tailcone is readily discernible. Most Sk35Cs have been left in natural metal markings with a light grey radome (though some have been observed with a black radome, as well). Markings are minimal, with the wing badge and tail number visible on the vertical fin, the national insigne on the fuselage and wings, the wing number on the forward fuselage, and the aircraft serial number on the empennage.

Göran Henriksson

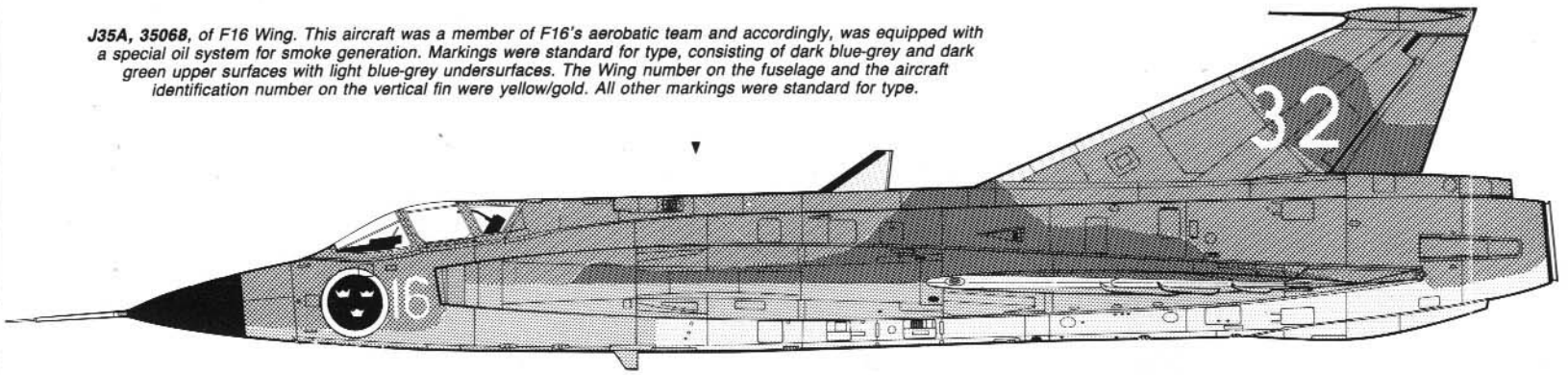
J35D, 35337, of F21 Wing at Lülea during 1985. The camouflage which, with the exception of the nose radome, covered virtually all of the aircraft including the leading edges of the wings and vertical fin, was used during a brief military exercise and was quite temporary, having been applied with chemically soluble paints. Only a small portion of the underside of the fuselage was left unpainted, and as can be seen, the small centerline drop tanks were left natural metal.

SAAB

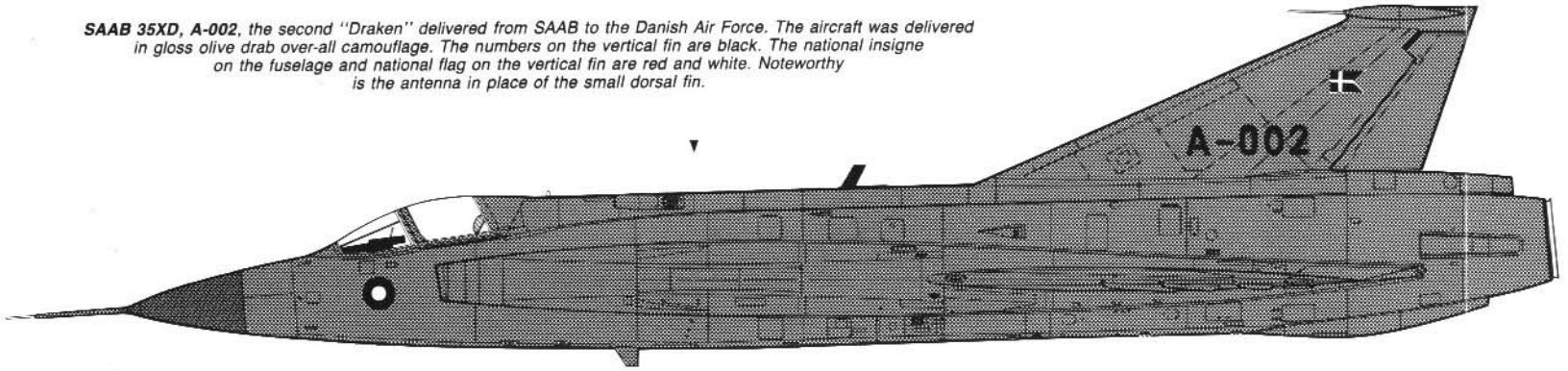
One of the two most recent "Draken" variants (the other being the Swedish Air Force J35J) to be rolled out is the J35Ö of the Austrian Air Force. The grey-on-grey camouflage obviously is quite contemporary and reminiscent of similar schemes seen on U.S. fighters. The Austrian J35Os originally were J35Fs. They have gone through a major network under the auspices of SAAB and the Swedish government. As delivered, they are approximately equivalent to the J35F[1] and have limited weapons capability.

SELECT MARKINGS:

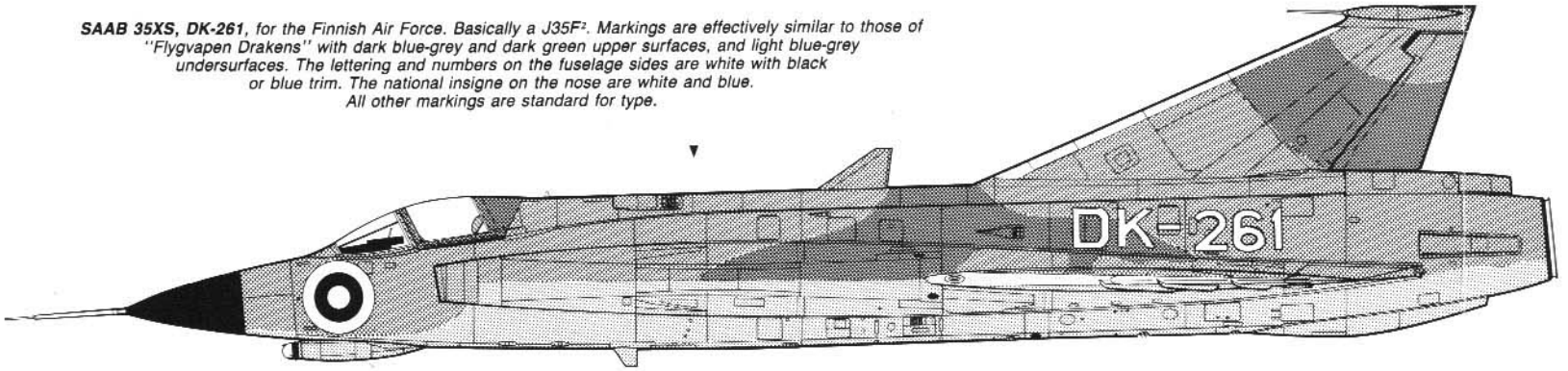
***J35A, 35068**, of F16 Wing. This aircraft was a member of F16's aerobatic team and accordingly, was equipped with a special oil system for smoke generation. Markings were standard for type, consisting of dark blue-grey and dark green upper surfaces with light blue-grey undersurfaces. The Wing number on the fuselage and the aircraft identification number on the vertical fin were yellow/gold. All other markings were standard for type.*



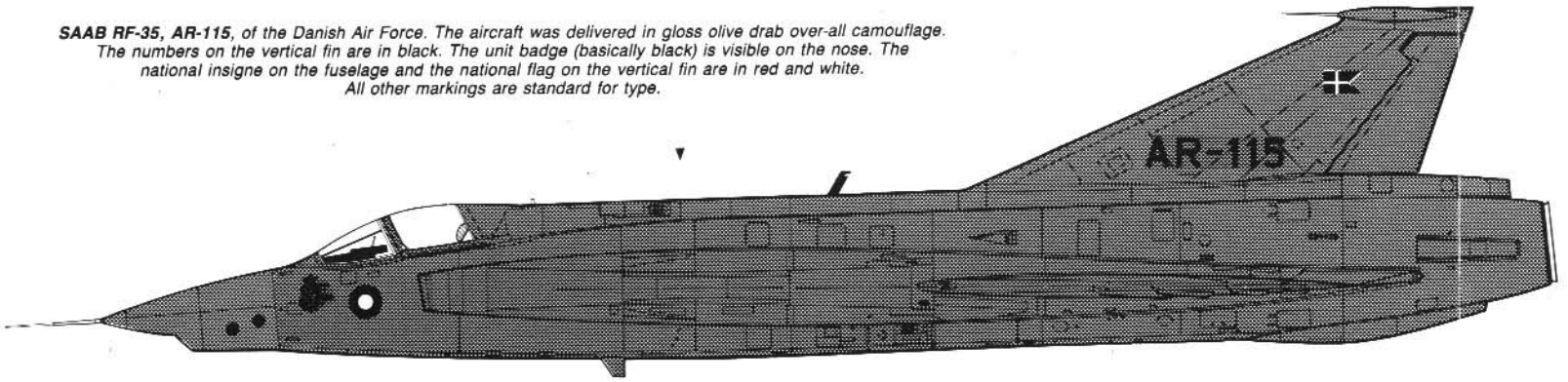
***SAAB 35XD, A-002**, the second "Draken" delivered from SAAB to the Danish Air Force. The aircraft was delivered in gloss olive drab over-all camouflage. The numbers on the vertical fin are black. The national insigne on the fuselage and national flag on the vertical fin are red and white. Noteworthy is the antenna in place of the small dorsal fin.*



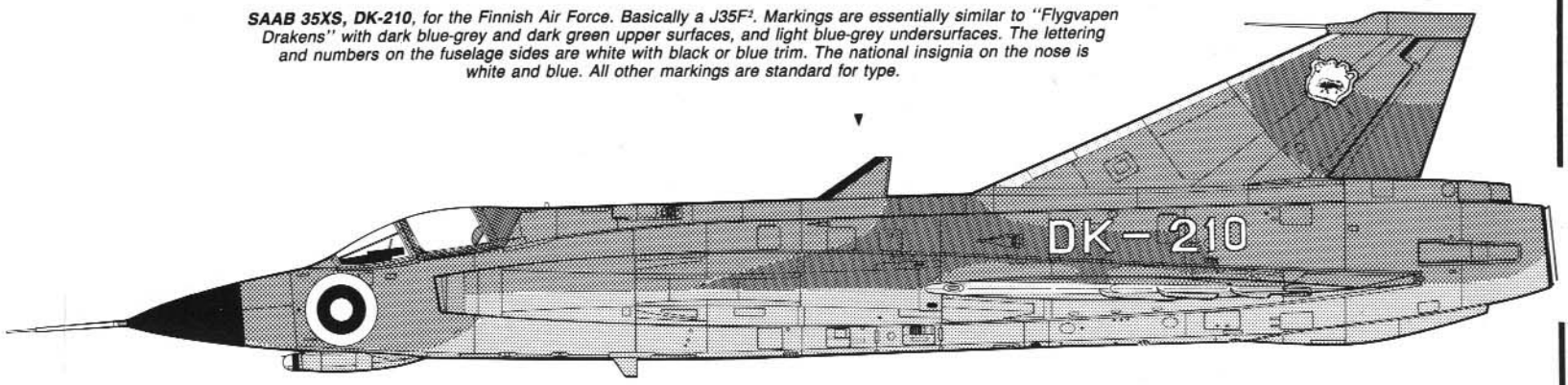
***SAAB 35XS, DK-261**, for the Finnish Air Force. Basically a J35F². Markings are effectively similar to those of "Flygvapen Drakens" with dark blue-grey and dark green upper surfaces, and light blue-grey undersurfaces. The lettering and numbers on the fuselage sides are white with black or blue trim. The national insigne on the nose are white and blue. All other markings are standard for type.*



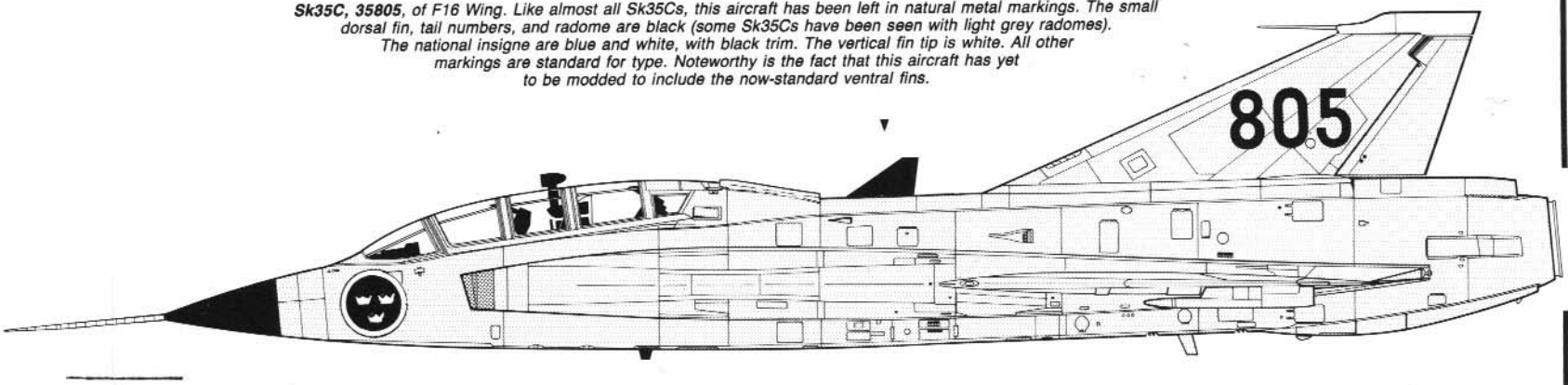
***SAAB RF-35, AR-115**, of the Danish Air Force. The aircraft was delivered in gloss olive drab over-all camouflage. The numbers on the vertical fin are in black. The unit badge (basically black) is visible on the nose. The national insigne on the fuselage and the national flag on the vertical fin are in red and white. All other markings are standard for type.*



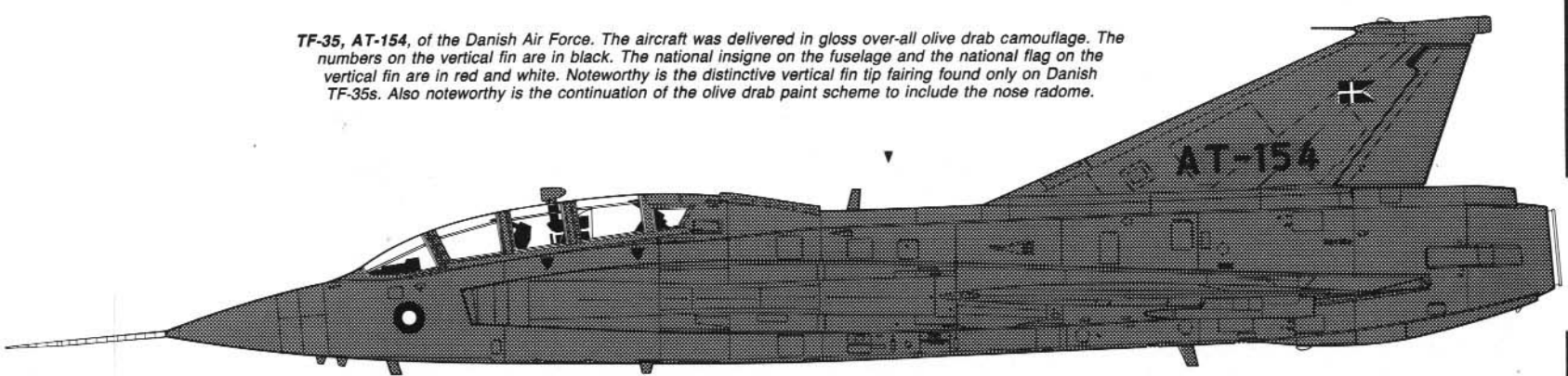
***SAAB 35XS, DK-210**, for the Finnish Air Force. Basically a J35F². Markings are essentially similar to "Flygvapen Drakens" with dark blue-grey and dark green upper surfaces, and light blue-grey undersurfaces. The lettering and numbers on the fuselage sides are white with black or blue trim. The national insignia on the nose is white and blue. All other markings are standard for type.*



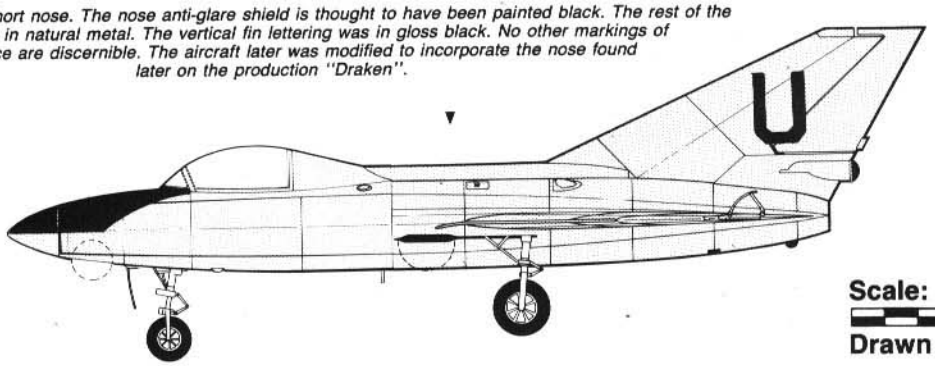
***Sk35C, 35805**, of F16 Wing. Like almost all Sk35Cs, this aircraft has been left in natural metal markings. The small dorsal fin, tail numbers, and radome are black (some Sk35Cs have been seen with light grey radomes). The national insigne are blue and white, with black trim. The vertical fin tip is white. All other markings are standard for type. Noteworthy is the fact that this aircraft has yet to be modded to include the now-standard ventral fins.*



***TF-35, AT-154**, of the Danish Air Force. The aircraft was delivered in gloss over-all olive drab camouflage. The numbers on the vertical fin are in black. The national insigne on the fuselage and the national flag on the vertical fin are in red and white. Noteworthy is the distinctive vertical fin tip fairing found only on Danish TF-35s. Also noteworthy is the continuation of the olive drab paint scheme to include the nose radome.*



***SAAB 210A**, with its short nose. The nose anti-glare shield is thought to have been painted black. The rest of the aircraft was left in natural metal. The vertical fin lettering was in gloss black. No other markings of consequence are discernible. The aircraft later was modified to incorporate the nose found later on the production "Draken".*

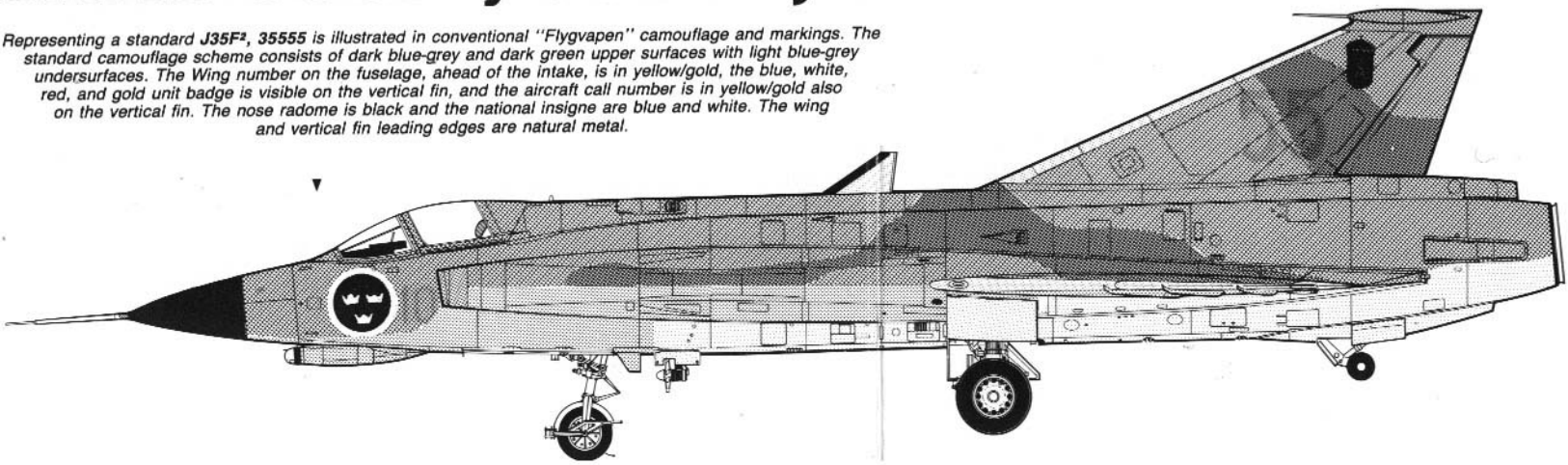


Scale: 1/72nd

Drawn by: Mike Wagnon

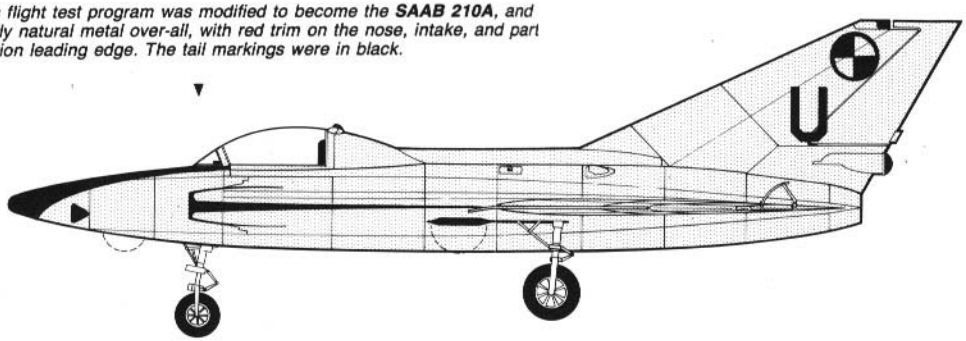
SAAB J35F², 35555, OF F10 WING

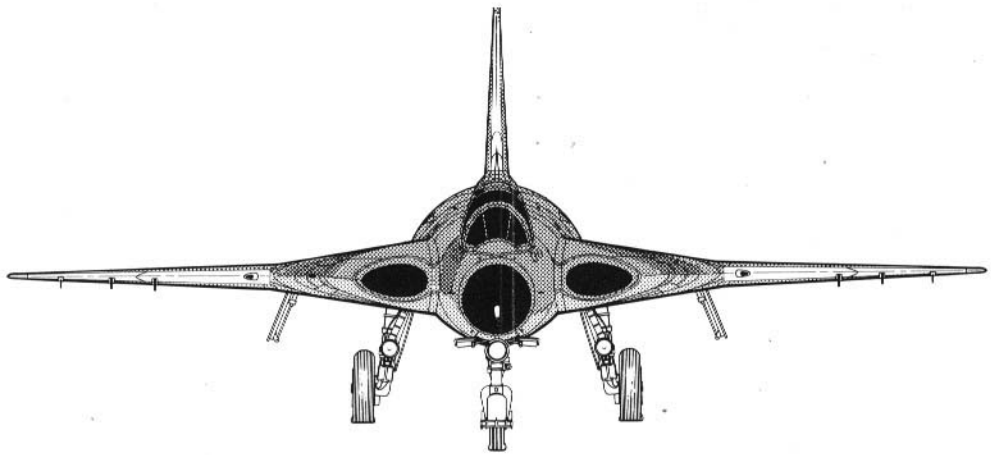
*Representing a standard **J35F², 35555** is illustrated in conventional "Flygvapen" camouflage and markings. The standard camouflage scheme consists of dark blue-grey and dark green upper surfaces with light blue-grey undersurfaces. The Wing number on the fuselage, ahead of the intake, is in yellow/gold, the blue, white, red, and gold unit badge is visible on the vertical fin, and the aircraft call number is in yellow/gold also on the vertical fin. The nose radome is black and the national insigne are blue and white. The wing and vertical fin leading edges are natural metal.*

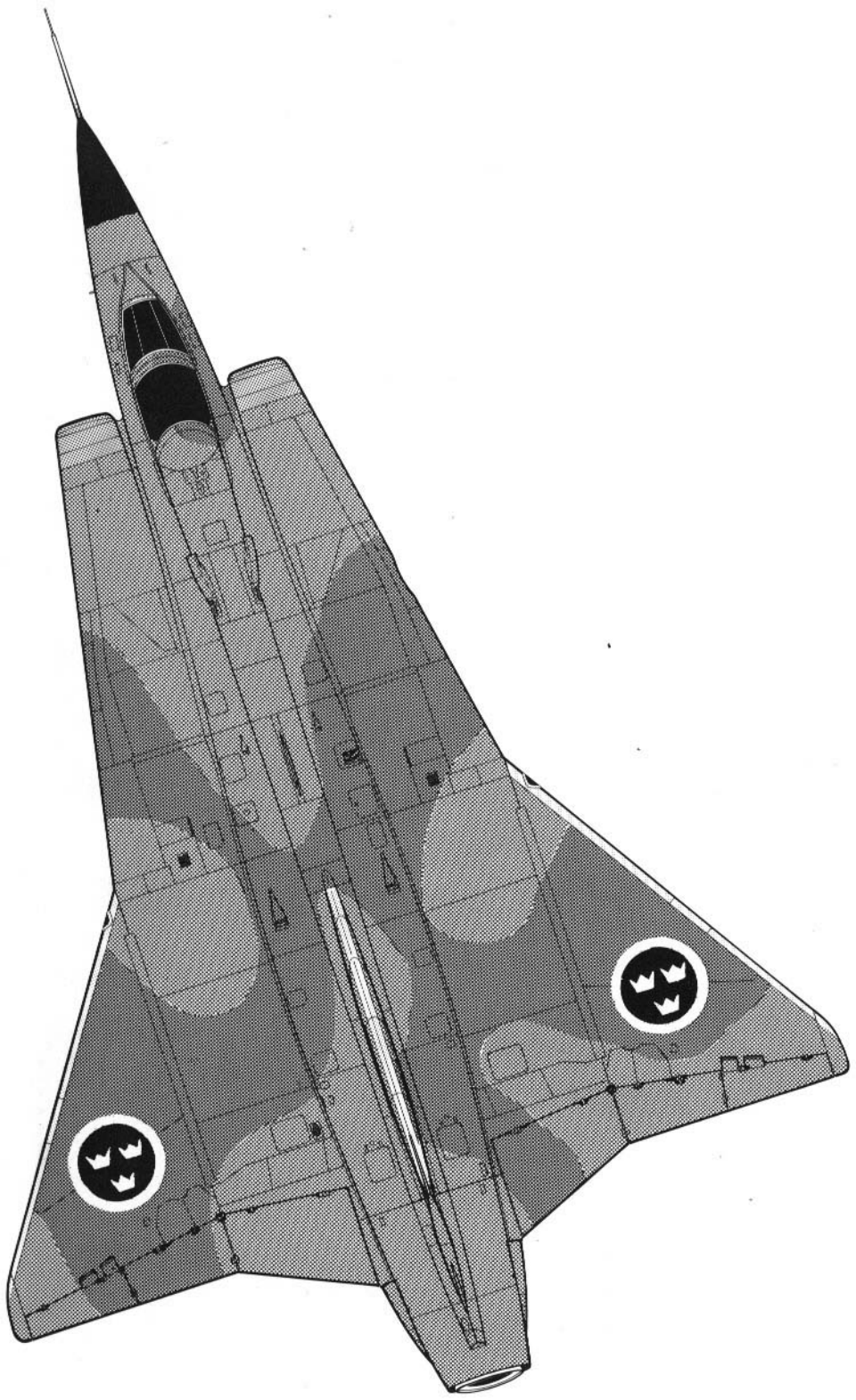


Note: The following colors have been utilized on the "Draken" during the course of its lengthy career (the list includes colors utilized by non-indigenous air forces): black, white, natural metal, dark blue (KFF 438/F.S. 35042), olive green (KATF 325/F.S. 34086), blue-grey (KFF 058/F.S. 36152), red, blue, yellow, dayglo red, dayglo yellow, lime green, sky blue/light French blue, RDAF olive drab (BS.381C/298), gold, light brown, medium brown, orange, and mid-grey. Additionally, it should be noted that the "Draken's" nose cone, intakes, and various aerial components are made of fiberglass and therefore usually are left in natural colors. "Flygvapnet" intake warning markings are black and yellow while those of the Finnish Air Force are red and yellow. Nose pitot booms usually are striped with yellow and other colors.

*The **SAAB 210**, which during the course of its flight test program was modified to become the **SAAB 210A**, and the **SAAB 210B** (illustrated), was generally natural metal over-all, with red trim on the nose, intake, and part of the inboard wing section leading edge. The tail markings were in black.*

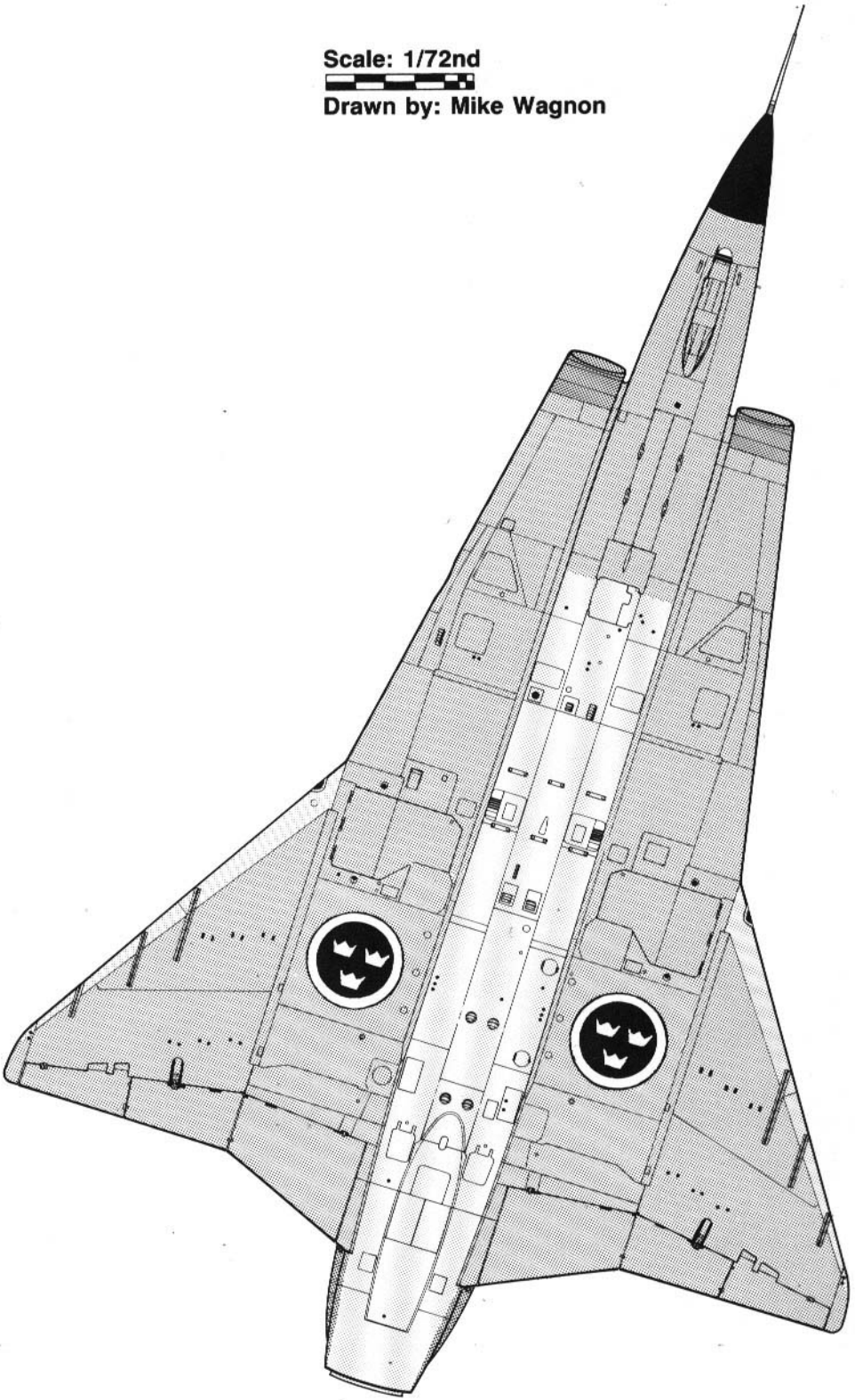


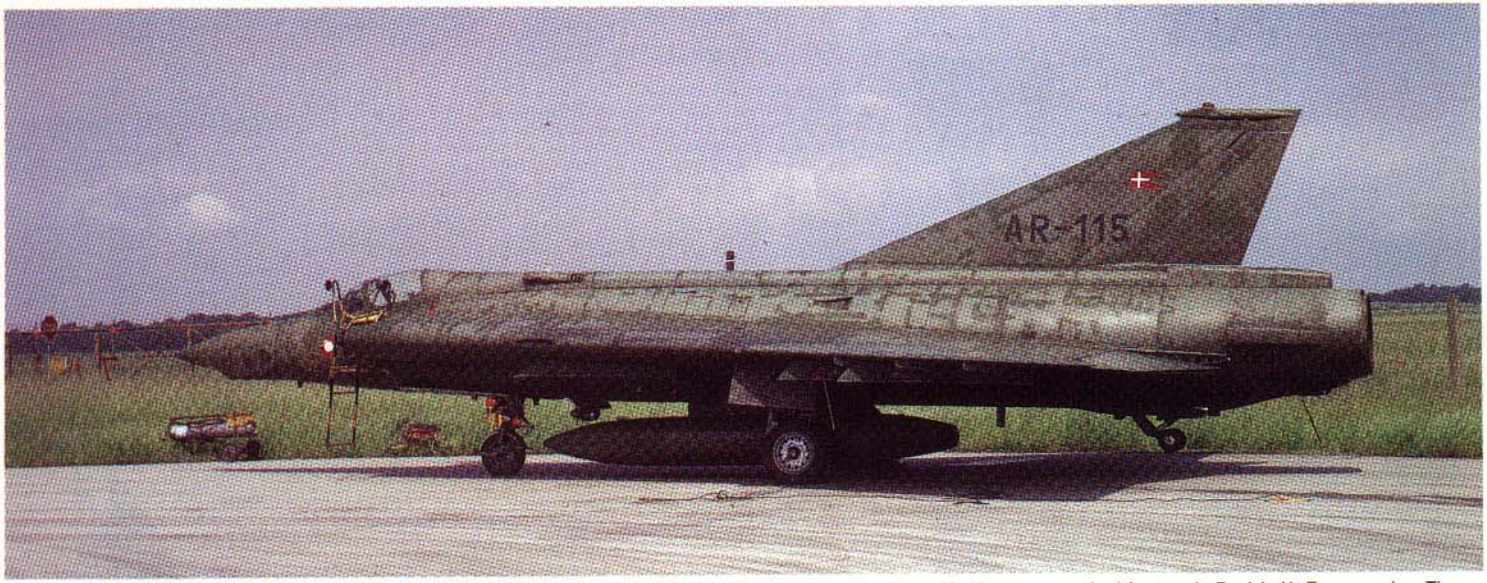




Scale: 1/72nd

Drawn by: Mike Wagnon





Aerofax, Inc. collection

Danish RF-35, AR-115, at Bremmgarten AB, Germany, with standard olive drab on mottled green camouflage. Markings are standard for type in Danish Air Force service. The RF-35 is equipped with an S35E recce nose and has provisions for 30 mm cannon in the wings. The wing pylons also can be used to accommodate drop tanks and some sensors. The centerline pylons can be used to accommodate a sensor pod and fuel tank combination, with the sensor pod usually mounted on the left.

Aerofax, Inc. collection

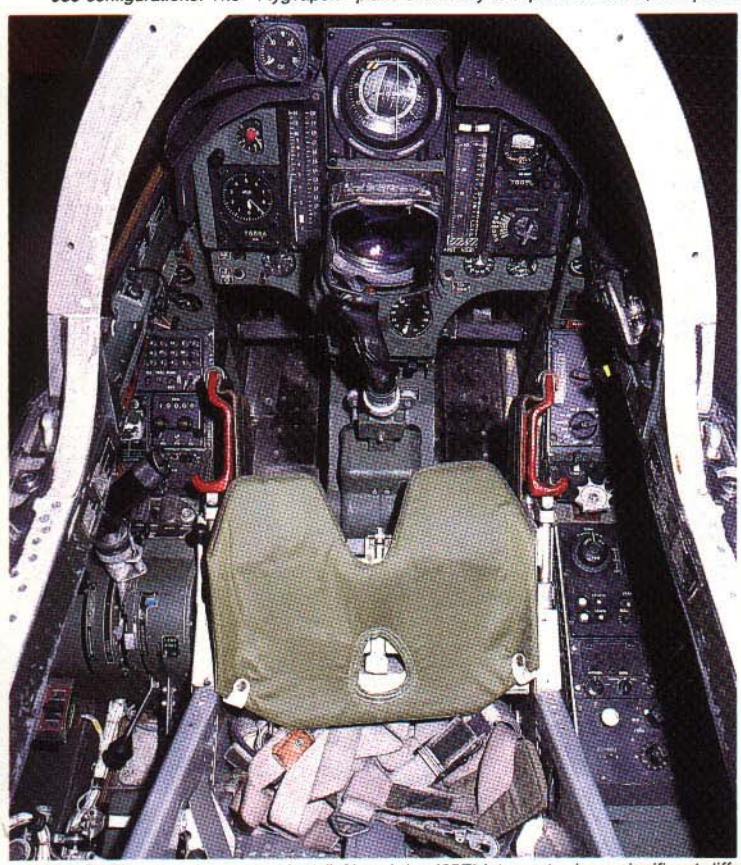
Danish Air Force TF-35, AT-153, on June 18, 1978. This variant generally was similar to the "Flygvapen's" Sk35C two-seat trainer and had only minor variations in cockpit accouterments and internal aircraft systems. The gloss olive drab over-all camouflage was typical of Danish Air Force "Drakens" shortly after their delivery. A matte scheme was adopted at a later date, toning down the reflectivity of the paint. Noteworthy are the night formation strip lights on the wing/intake and vertical fin.

Göran Henriksson

SAAB 35XS, DK-203 (ex-351303), of the Finnish Air Force on May 10, 1987. Markings, which generally resemble those found on "Flygvapen" aircraft, consist of a dark blue-grey and dark green upper surface with a light blue-grey undersurface. The SAAB 35XSs were delivered void of all but basic weapons capability. Like the J35F[1], there was no infrared detector under the nose, and the aircraft therefore was not capable of utilizing the Rb.24 "Sidewinder" infrared homing air-to-air missile.

Peter Liander

The most recent "Draken" variant to enter the "Flygvapen" inventory is the J35J. Equipped with additional external pylons (seen with Rb.24 "Sidewinder" missiles) under the forward section of the wing inboard surface, and strengthened outboard pylons permitting heavier external payloads, the J35J offers significant improvements over the earlier J35 configurations. The "Flygvapen" plans eventually to repaint all J35Js, and possibly earlier J35 variants, in the same grey-on-grey camouflage seen on Austrian J35AÖs.



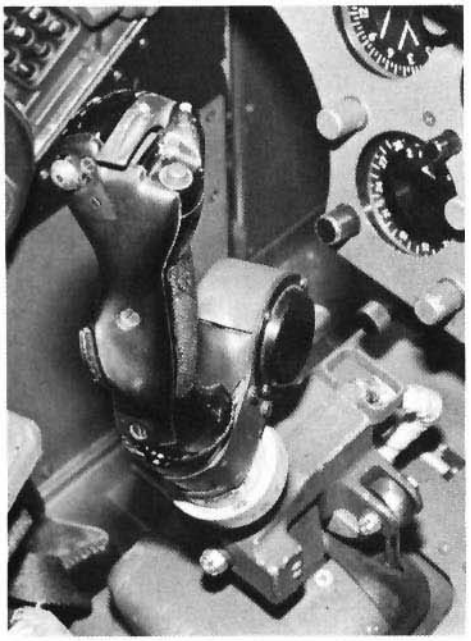
Peter Liander

Göran Henriksson

The S35E reconnaissance variant (left) and the J35F² interceptor have significant differences in their cockpit configurations. The former has an instrument panel dominated by an optical sight and associated sensor related indicators, and the latter, an instrument panel dominated by a radar scope and associated gunsight. Both panels are equipped with vertical displays and conventional flight instruments. Miscellaneous sub-panels are mounted on the two side consoles.

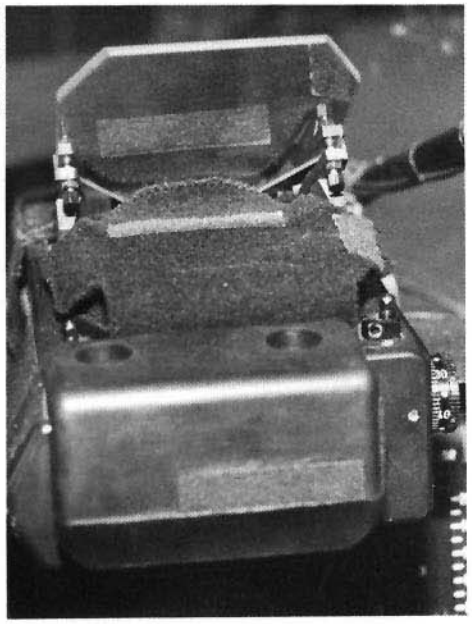
IN DETAIL:

Göran Henriksson



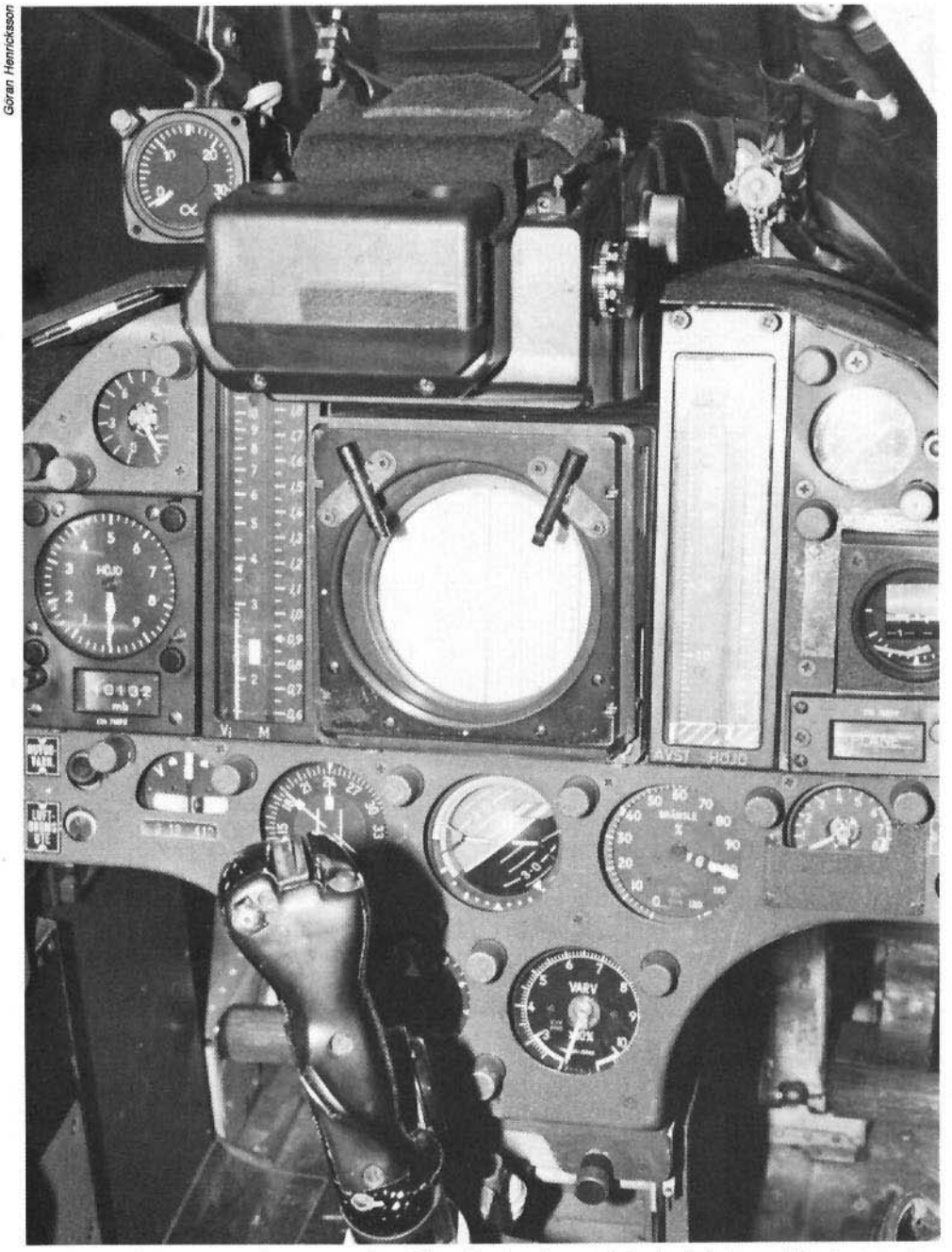
The main instrument panel of a J35F¹. Mounted above the panel is the gunsight. Flight instrumentaton is located under the radar scope.

Göran Henriksson



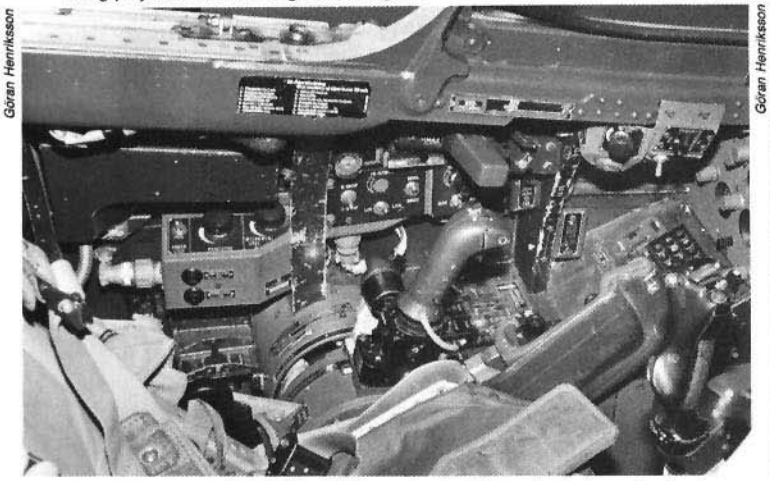
The J35F gunsight, attached to the top of the instrument panel, is conventional in operation with imagery being projected onto the angled reticle glass.

Göran Henriksson



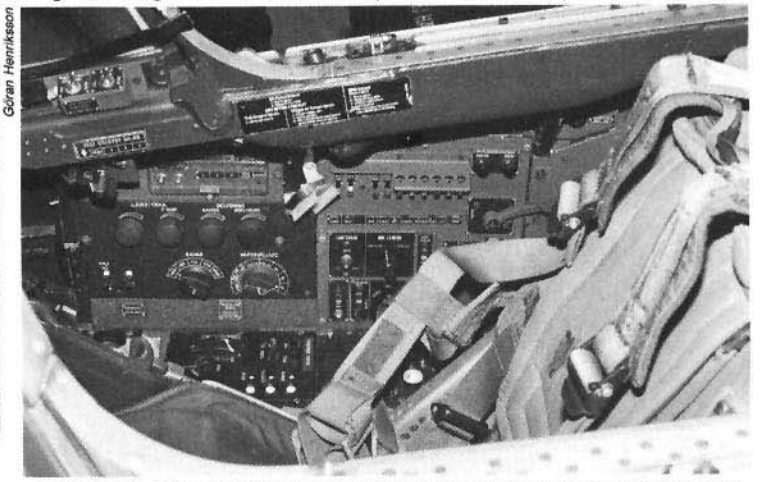
J35F¹main instrument panel arrangement is well thought-out and purposefully simple. Instrumentation is arranged logically around the centrally-mounted radar screen, with vertical displays for Mach number and angle-of-attack on either side. Flight and navigation instrumentation occupies most of the lower panel.

Göran Henriksson

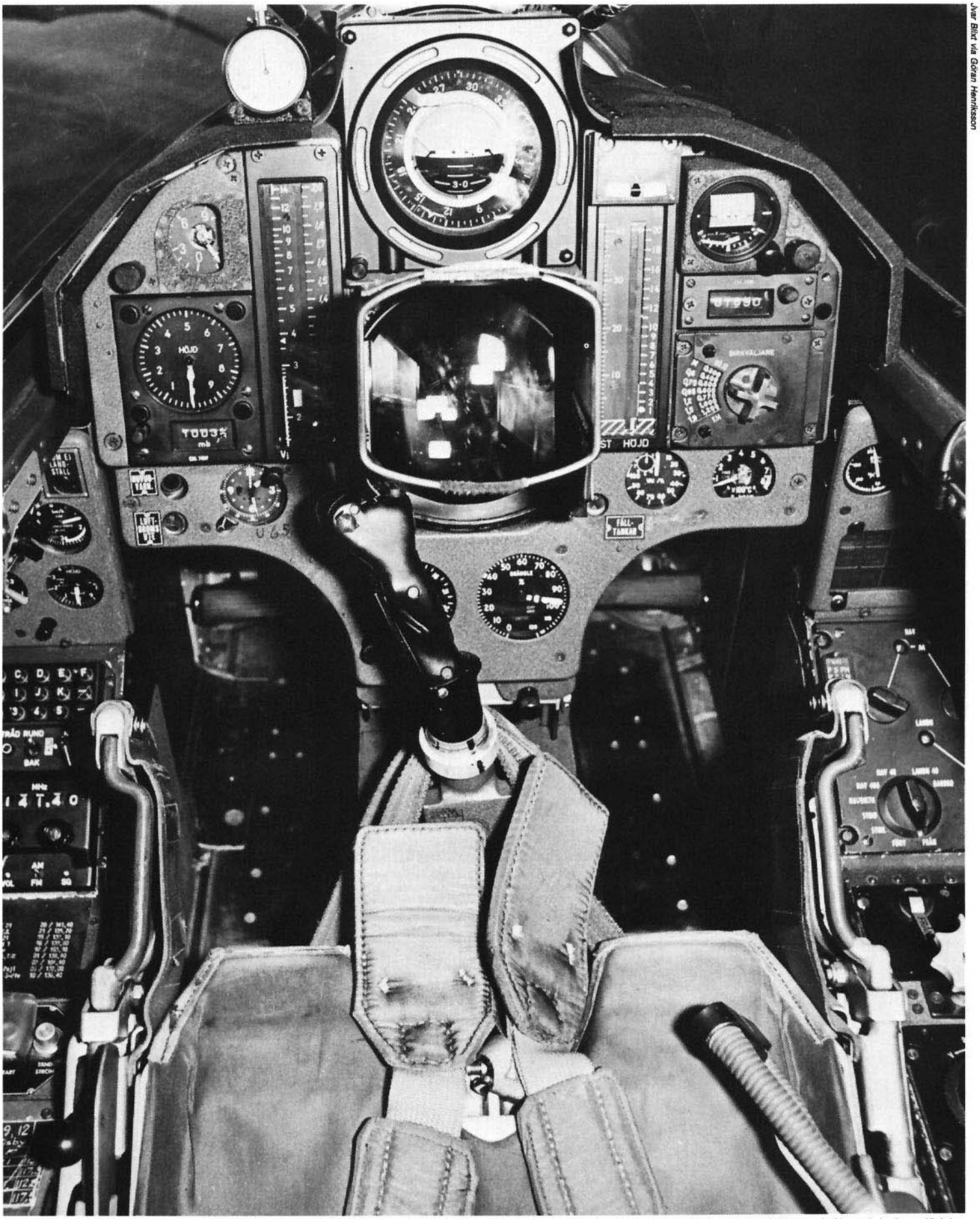


Left side console panel of J35F¹. Visible are the throttle quadrant, the radar steering handle, the cockpit canopy lock, the interior lighting panel, and miscellaneous sensor system and communications controls.

Göran Henriksson



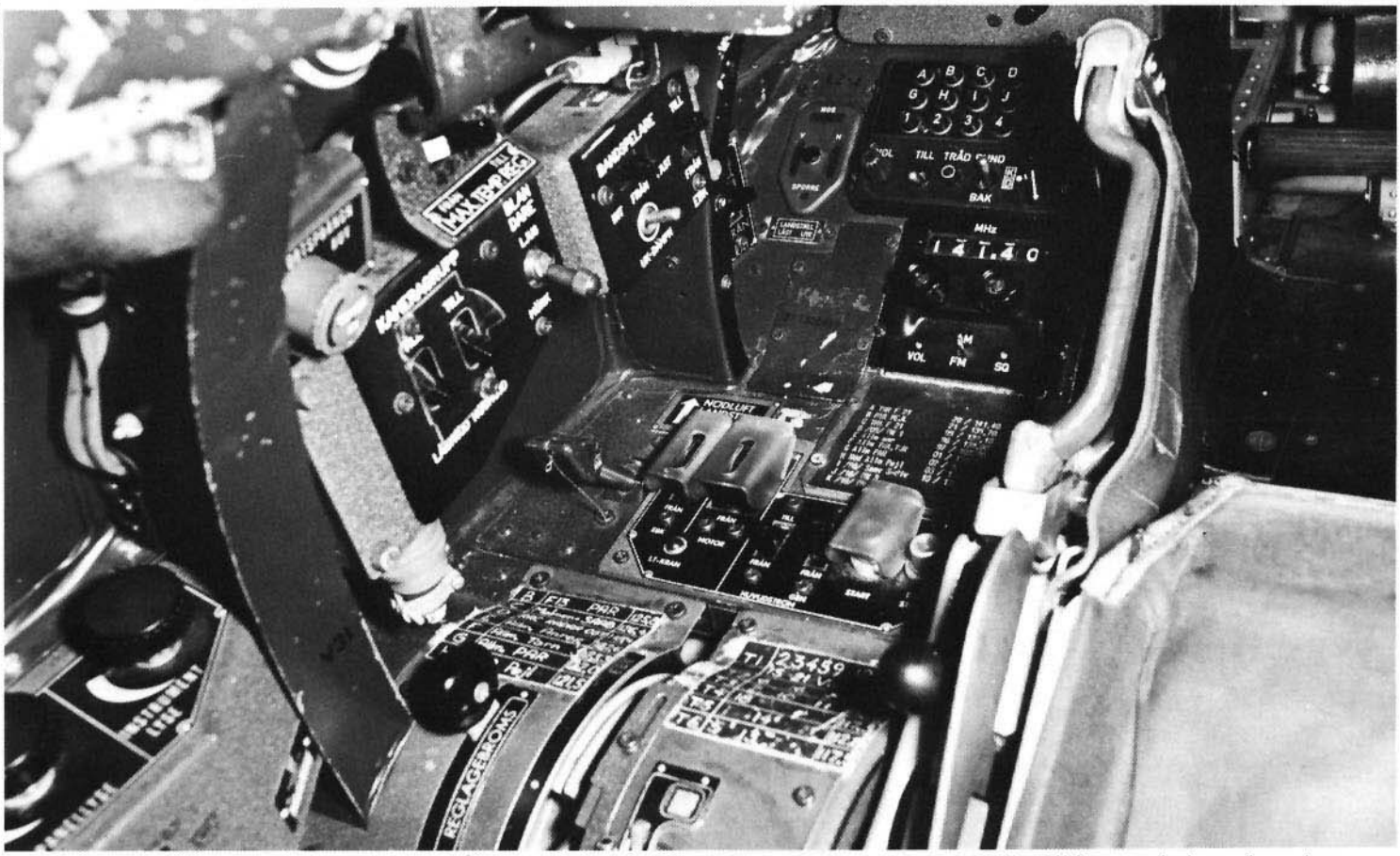
Right side console panel of J35F¹ supports most of the radar and communications sub-panels and the cockpit environmental system controls. Additionally, autopilot inputs are accommodated through a sub-panel integrated with the navigation system.



Jvar Blixt via Göran Henriksson

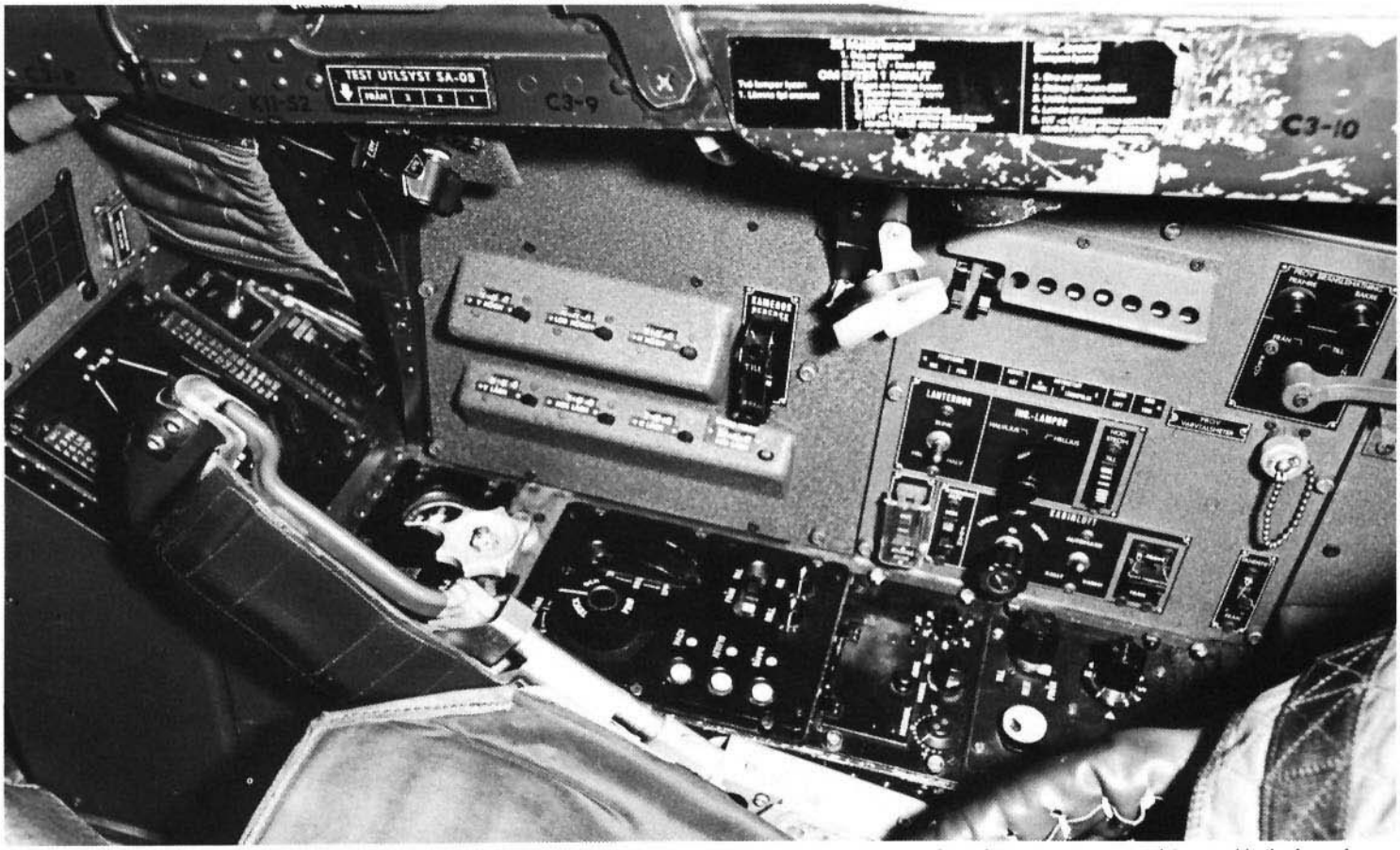
The main instrument panel of an S35E. The periscope for locating ground targets for the aircraft's optical sensors is prominent in the center of the panel. Above it is the artificial horizon and a surrounding compass ring. The vertical displays on either side are related to airspeed, Mach, and Mach/altitude hold. Other instrumentation accommodates engine readouts, altitude, and various emergency indicators. The control stick is angularly offset to the left for ergonomics.

Jvar Blixt via Göran Henriksson



The left console of an S35E accommodates the throttle quadrant, additional engine controls (start-up switches, etc.), several VHF and UHF communications radios, and camera electrical power switches. Visible at the top is the steering control. The left console also accommodates cockpit and external lighting controls which regulate instrumentation lights and the landing lights attached to the main landing gear. Additionally, some of the equipment required for fuel control is located on the left console.

Jvar Blixt via Göran Henriksson



The right console of an S35E accommodates various camera switches and related panels, the oxygen system control panel, an emergency enunciator panel in the form of backlit data blocks, night lighting equipment for the instrument panel, and angular setting indicators. Also visible in this view is the right ejection seat handle which when pulled up in an emergency, ignites the seat's propulsion system. The inside part of the handle is leather-lined to provide upper leg padding.

Chris Pocock

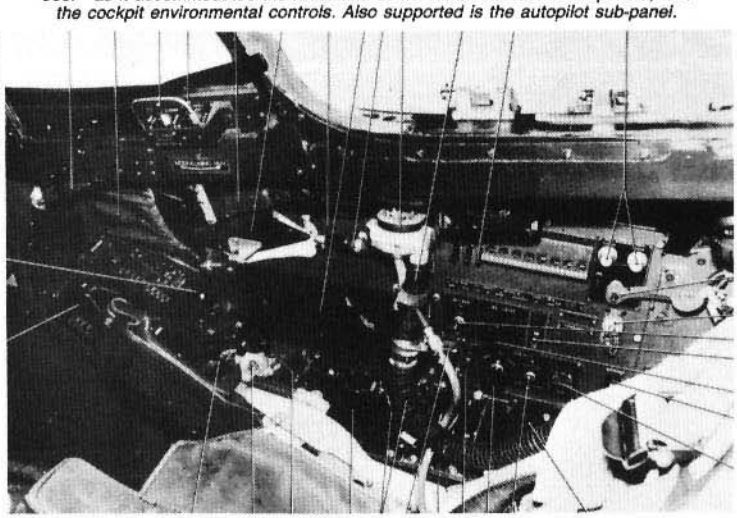
Left side console panel of late J35D is quite similar in most respects to that of the J35F[1] as it accommodates the throttle quadrant, the radar control handle, part of the communications system, and some of the interior lighting controls.

Chris Pocock

Right side console panel of late J35D is quite similar in most respects to that of the J35F[1] as it accommodates the radar and some communications sub-panels, and the cockpit environmental controls. Also supported is the autopilot sub-panel.

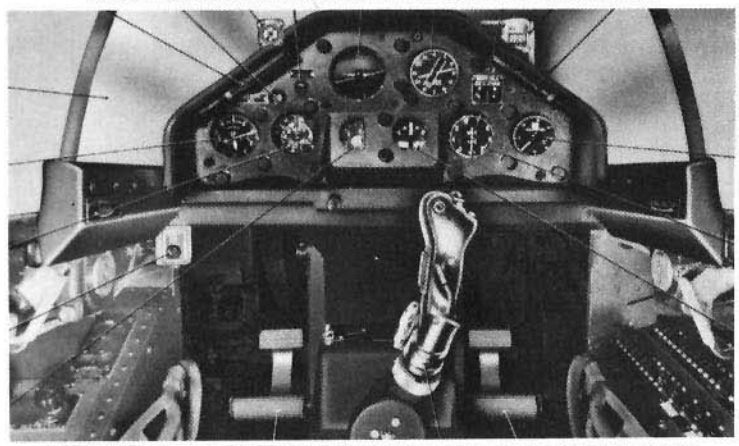
SAAB via Robert F. Dorr

Aft cockpit of the Sk35C two-seat trainer. The aft cockpit panel is equipped with minimal flight-related instrumentation and communications radios. The right console also accommodates the circuit breakers for the entire aircraft.



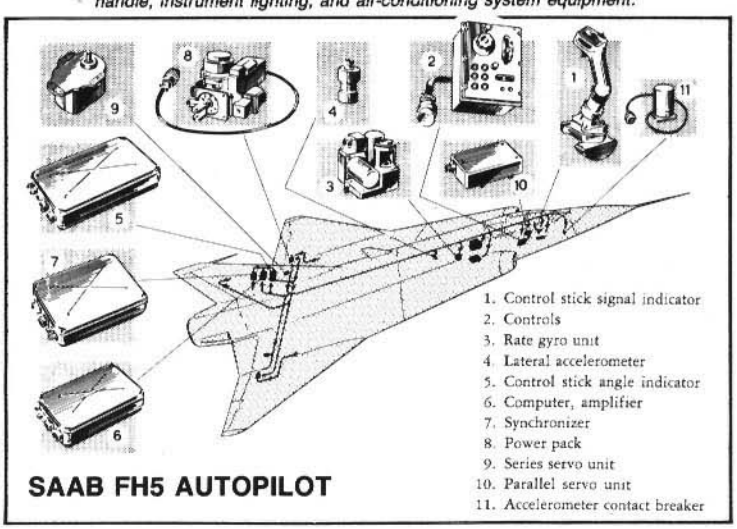
SAAB via Robert F. Dorr

The Sk35C front cockpit left console accommodates the student pilot's throttle quadrant, landing gear controls, communications radio panels, canopy lock/unlock handle, instrument lighting, and air-conditioning system equipment.



SAAB via Robert F. Dorr

The Sk35C front cockpit right console accommodates the student pilot's oxygen system, an emergency system enunciator panel, some electrical system circuit breakers, and miscellaneous VHF and UHF radio panels.

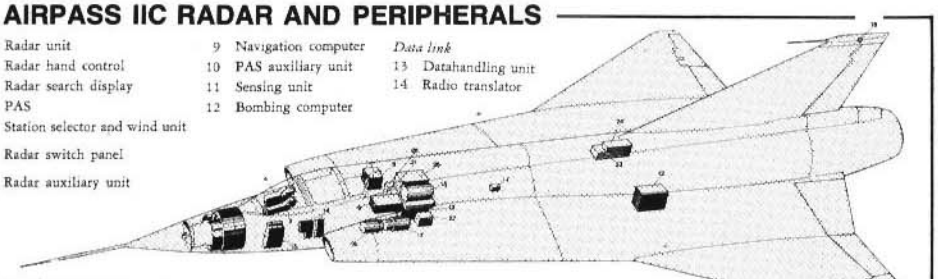


SAAB FH5 AUTOPILOT

AIRPASS IIC RADAR AND PERIPHERALS

1 Radar unit
2 Radar hand control
3 Radar search display
4 PAS
5 Station selector and wind unit
6 Radar switch panel
7
8 Radar auxiliary unit
9 Navigation computer
10 PAS auxiliary unit
11 Sensing unit
12 Bombing computer

Data link
13 Datahandling unit
14 Radio translator



Master reference system
15 Gyro unit
16 Amplifier I
17 Amplifier II
18 Fluxgate
19 Control panel

Air data computer
20 Pressure unit
21 Servo unit

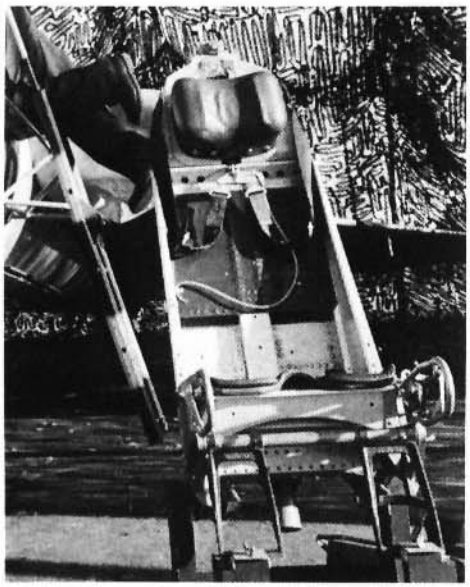
Doppler radar
22 Control panel
23 Tracker unit
24 Transmitter-receiver

TACAN
25 Control panel
26 Transmitter-receiver
27 Coupler unit

Instruments
28 Heading indicator
29 Range indicator

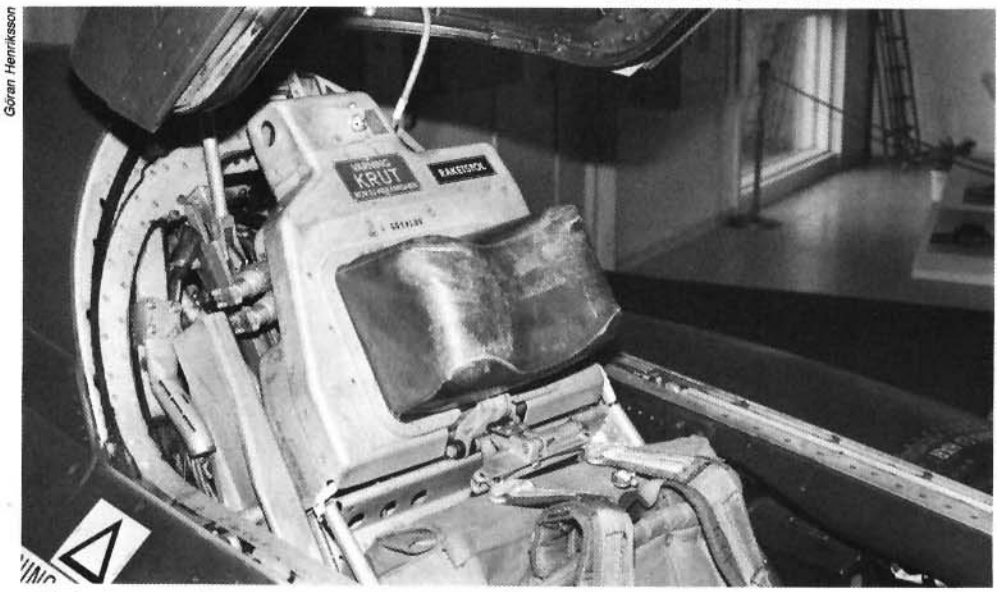
Göran Henriksson

The Sk35C is equipped with a stereoscopic periscope to accommodate the forward viewing requirements of the instructor pilot in their rear seat.



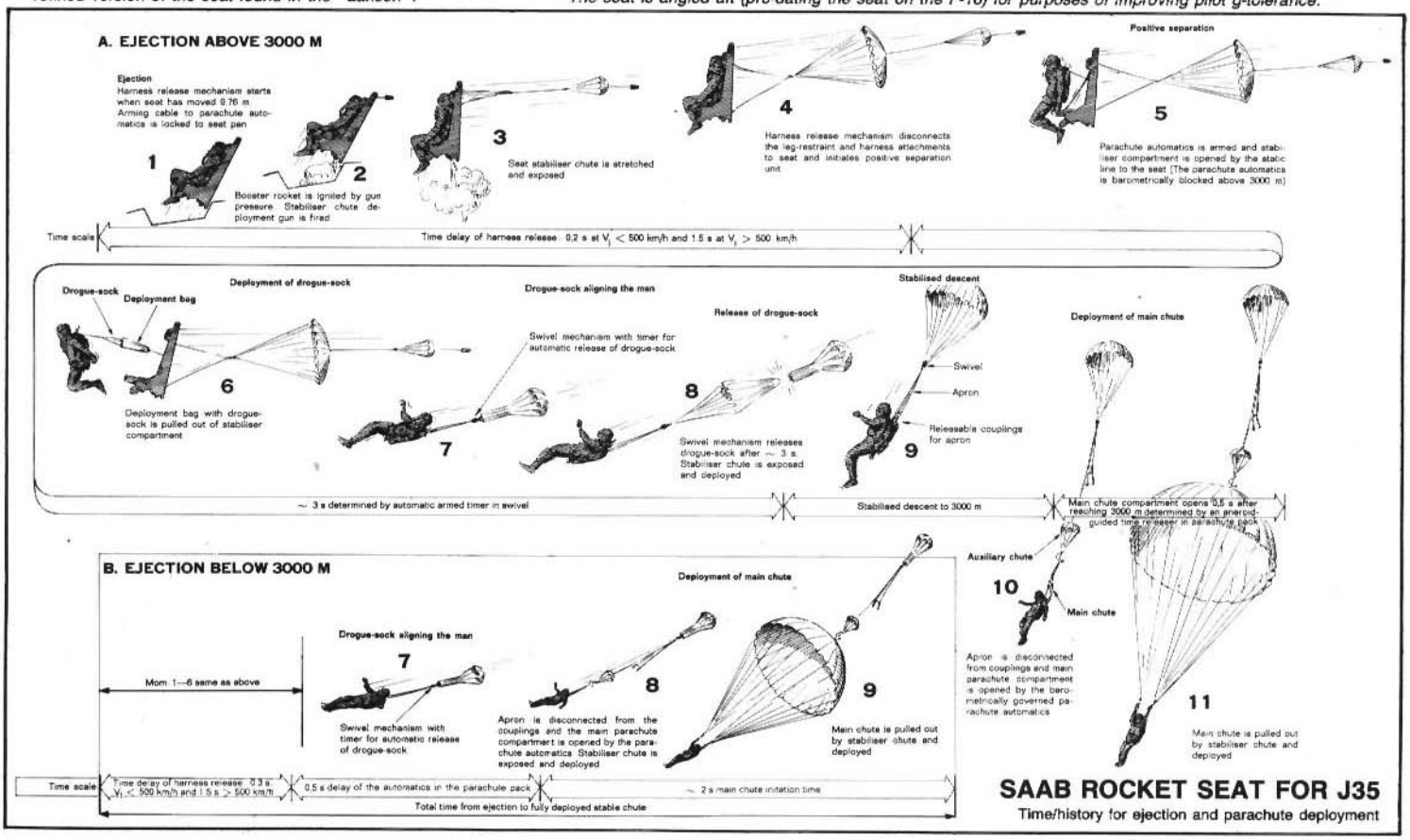
Göran Henriksson

Early "Drakens", such as the J35B, were equipped with a SAAB-developed ejection seat that was a refined version of the seat found in the "Lansen".



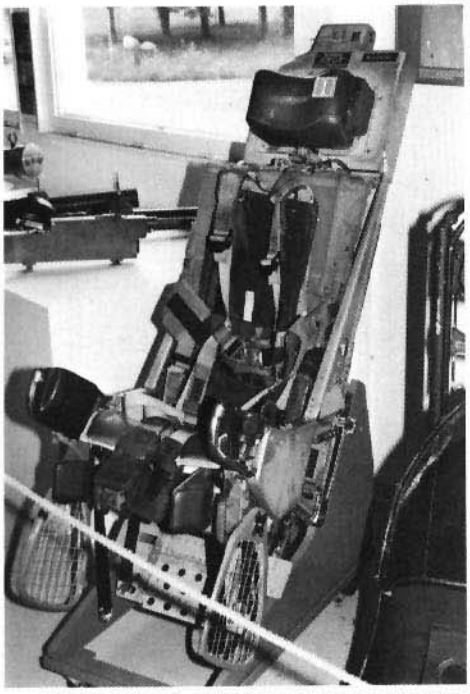
Göran Henriksson

The headrest assembly utilized on the SAAB 73SE-F seat used in the J35D and J35F. The leather-covered padding accommodates the helmet and back of the head of the pilot in a high-g environment and during takeoff. The seat is angled aft (pre-dating the seat on the F-16) for purposes of improving pilot g-tolerance.

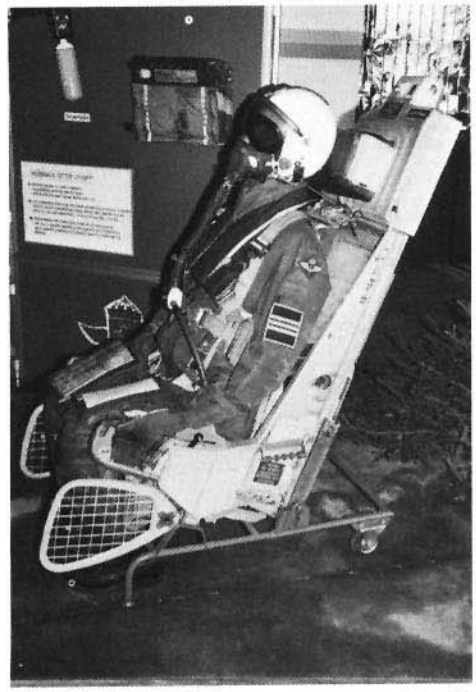

A. EJECTION ABOVE 3000 M
Ejection
Harness release mechanism starts when seat has moved 0.76 m. Arming cable to parachute automatics is locked to seat pan
1
2
Booster rocket is ignited by gun pressure. Stabiliser chute deployment gun is fired
3
Seat stabiliser chute is stretched and exposed
4
Harness release mechanism disconnects the leg-restraint and harness attachments to seat and initiates positive separation unit
Positive separation
5
Parachute automatics is armed and stabiliser compartment is opened by the static line to the seat (The parachute automatics is barometrically blocked above 3000 m)
Time scale
Time delay of harness release: 0.2 s at V_i < 500 km/h and 1.5 s at V_i > 500 km/h
Deployment of drogue-sock
Drogue-sock
Deployment bag
6
Deployment bag with drogue-sock is pulled out of stabiliser compartment
7
Drogue-sock aligning the man
Swivel mechanism with timer for automatic release of drogue-sock
Release of drogue-sock
8
Swivel mechanism releases drogue-sock after ~ 3 s. Stabiliser chute is exposed and deployed
Stabilised descent
Swivel
Apron
Releasable couplings for apron
9
Deployment of main chute
~ 3 s determined by automatic armed timer in swivel
Stabilised descent to 3000 m
Main chute compartment opens 0.5 s after reaching 3000 m determined by an aneroid-guided time releaser in parachute pack
B. EJECTION BELOW 3000 M
Mom 1—6 same as above
Drogue-sock aligning the man
7
Swivel mechanism with timer for automatic release of drogue-sock
8
Apron is disconnected from the couplings and the main parachute compartment is opened by the parachute automatics. Stabiliser chute is exposed and deployed
Deployment of main chute
9
Main chute is pulled out by stabiliser chute and deployed
Auxiliary chute
10
Main chute
Apron is disconnected from couplings and main parachute compartment is opened by the barometrically governed parachute automatics
11
Main chute is pulled out by stabiliser chute and deployed
Time scale
Time delay of harness release: 0.2 s V_i < 500 km/h and 1.5 s > 500 km/h
0.5 s delay of the automatics in the parachute pack
~ 2 s main chute initation time
Total time from ejection to fully deployed stable chute

SAAB ROCKET SEAT FOR J35

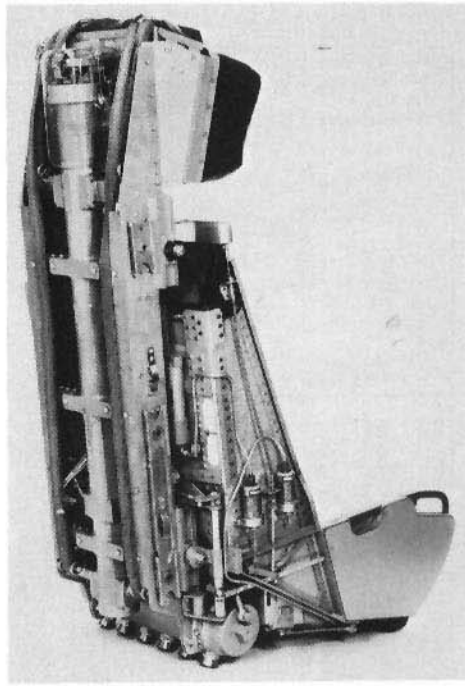
Time/history for ejection and parachute deployment



Göran Henriksson



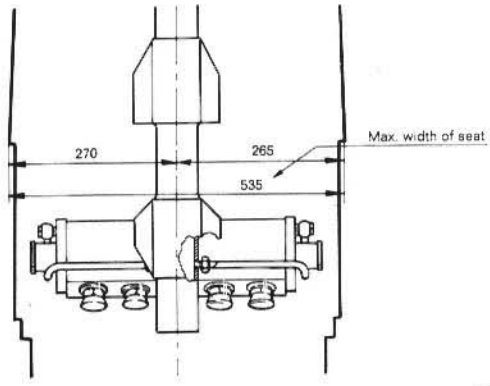
Chris Pocock

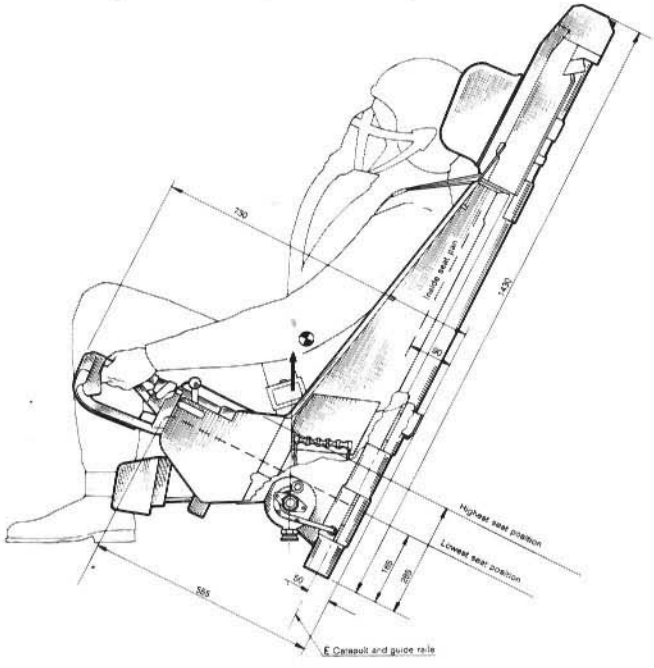


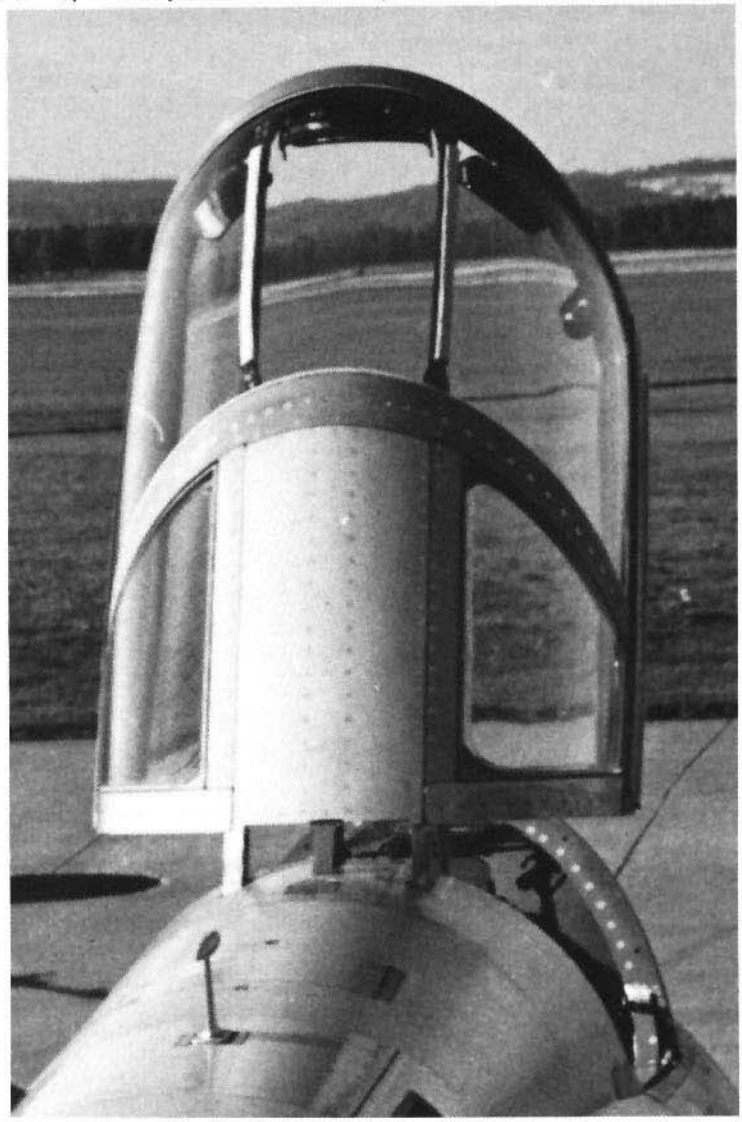
SAAB via David Anderton

The 73SE-F seat, which first was introduced on the J35D, has been steadily improved during the course of the "Draken's" production history. The early seat, depicted in the two left photos, had somewhat primitive leg restraints that resembled tennis racquets. Later seats went to an all metal structure of more modern design. All versions of the seat were rocket propelled, but not zero-zero capable. A British-manufactured GQ parachute system serves to lower the pilot to earth following ejection.

73SE-F EJECTION SEAT DIMENSIONAL DATA



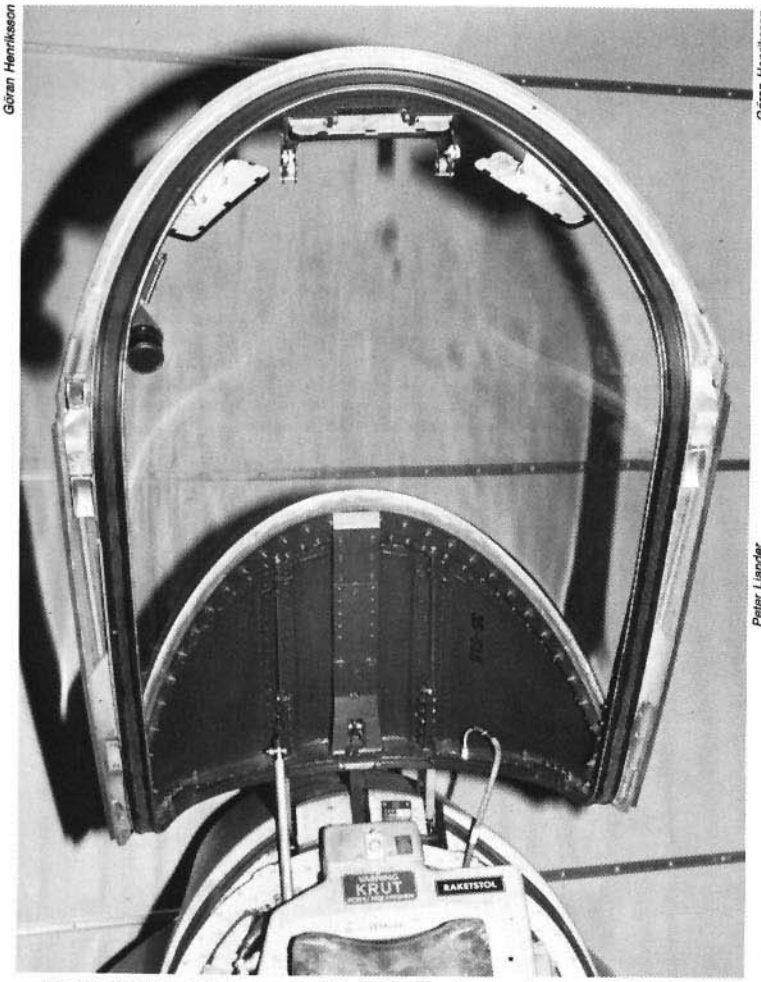




SAAB via Göran Henriksson

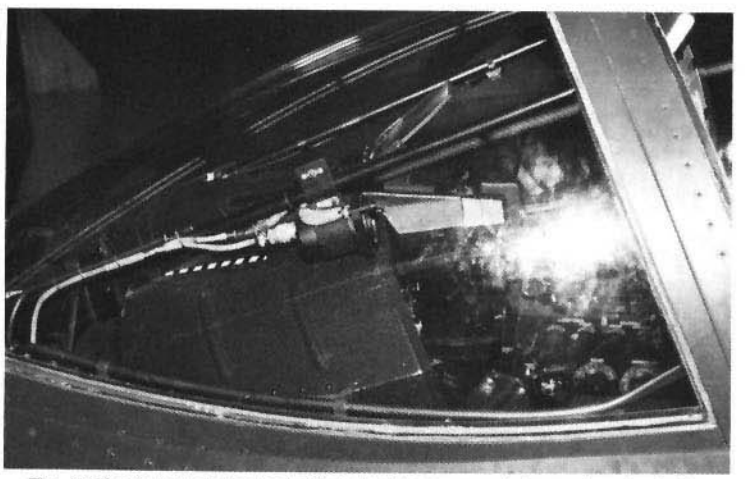
The "Draken" canopy has gone through a variety of subtle changes since the introduction of the first J35A during 1960. The initial framed canopy (through the J35D, shown) was conformal, flowing smoothly into the aircraft dorsal spine with no bulge.

Göran Henriksson



The single-piece bulged canopy of the J35F offers improved rearward vision for the pilot, which is decidedly important in an air-to-air combat situation. Convex aft-viewing mirrors complement the updated single-piece transparency.

Göran Henriksson



The J35F's windscreen also is slightly bulged to accommodate aerodynamically the bulging of the main canopy. Sitting on top of the instrument panel hood and combing is the gunsight reticle glass and an angle-of-attack indicator.

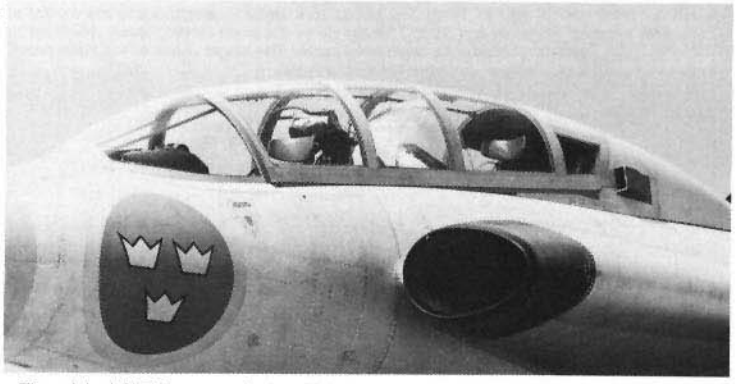
Peter Liander

External view of the J35F's bulged canopy. The unit opens upward via a single hydraulic actuator. Attached to the top of the canopy is a small headrest extension. Four mechanical hooks firmly lock the canopy in its closed position.

Göran Henriksson

The original J35A canopy was unbulged and framed, essentially dividing the canopy transparency into three parts. Sub-framing internally assured structural integrity under the stress of pressurization. The windscreen remained single-piece.

SAAB via Göran Henriksson



The original Sk35C canopy had multiple transparencies mounted in a one-piece, right-side-hinging frame. At a later date, a stereoscopic periscope for the instructor was installed about mid-canopy. The windscreen was unchanged.

Göran Henriksson collection

The operational Sk35C canopy accommodated the protruding stereoscopic periscope for the instructor. With the canopy hinged over the crew ingress and egress, the rigidly-braced periscope also moved up and out of the way.

Göran Henriksson

Bulging of the J35F² canopy is quite distinctive, as is the missing framework so apparent in early "Draken" variants. Pilot visibility is greatly improved and basic aerodynamics are not affected. The gunsight reduces forward visibility.

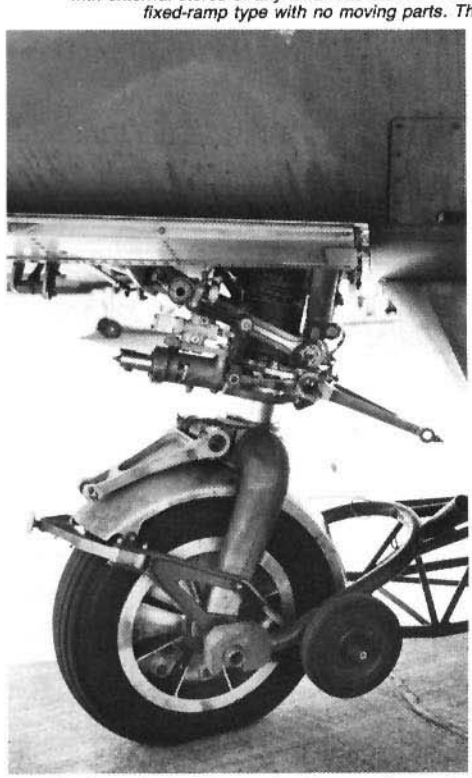
SAAB via Göran Henriksson

Göran Henriksson

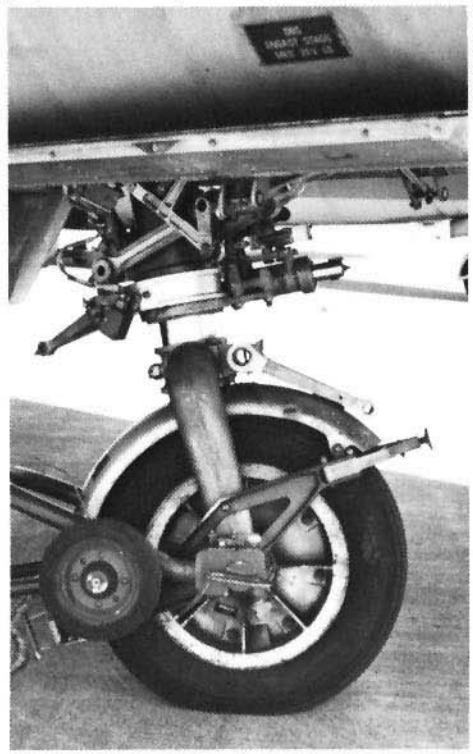
Right and left side views of J35F²s. Particularly prominent is the Hughes-developed infrared sensor mounted under the nose, just aft of the radome. The radome essentially is circular in cross-section and symmetrical in design. Noteworthy is the J35F's slightly extended intake lip which improved the mass flow requirements of the RM6C powerplant and its associated Model 66 afterburner. The intake lip is constructed of composites and usually is left unpainted.

Göran Henriksson

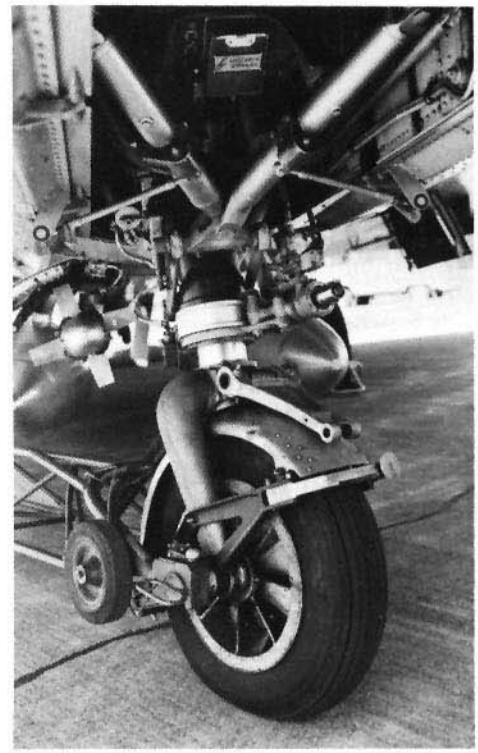
Direct front view of an F21 Wing J35D illustrates well the exceptionally low frontal area of the basic "Draken" configuration—particularly when it is clean, and not equipped with external stores of any kind. The stance of the main landing gear, which retract outward into wing wells, is noteworthy. The non-symmetrical oval intakes are of the fixed-ramp type with no moving parts. The single-piece windscreen provides optimal forward vision, though this is adversely affected by the gunsight.



Göran Henriksson



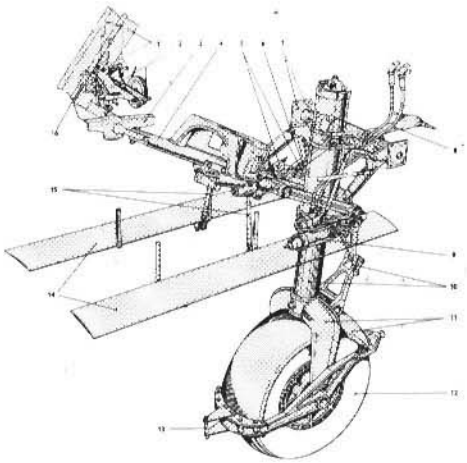
Göran Henriksson



Göran Henriksson

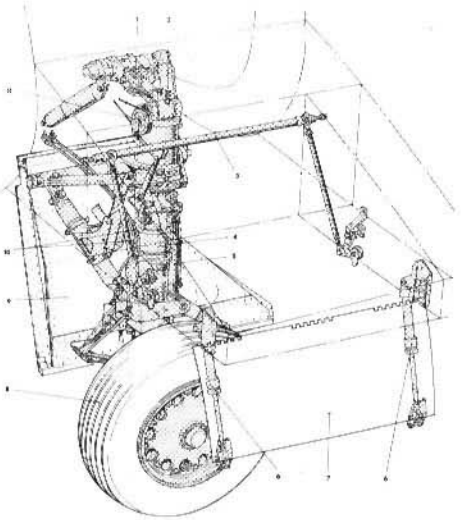
The forward-retracting nose landing gear (seen rotated 180° following towing) is of complex, yet rugged construction. A single oleo-strut accommodates the gear loads which are transmitted by a conventional axle-supporting fork. A mud guard with somewhat close tolerances prevents foreign matter (common when using back-country facilities for bases of operation) from being slung into the gear well. An anti-torque link is attached to the steering assembly and shimmy damper.

NOSE LANDING GEAR



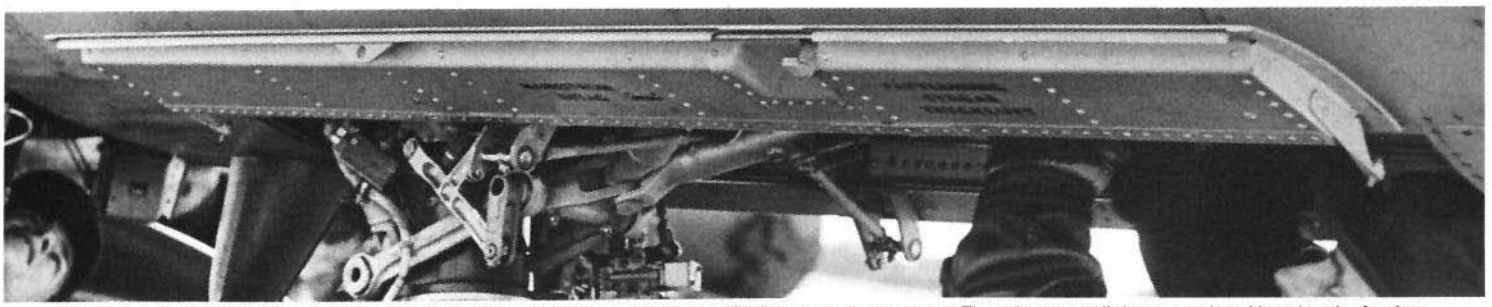
1 Monteringsbeslag, inåt (fäst på baksidan av förarutrymmesskottet)
2 Inåt
3 Lagerbeslag, fäststötta
4 Fästanhäta,
5 Indikeringsströmställare, låst utåt/låst läge
6 Låsstötta,
7 Lagringsaxel med lagerbeslag
8 Manövercylinder, nosställ
9 Styrservo
10 Ben med axeltappar
11 Hjulgaffel med stötdämpare
12 Nosthjul
13 Upphängningsbyglar, inåt/ut ställ
14 Nosställslucka
15 Manöverstänger, lucka
16 Indikeringsströmställare, låst inåt/ut läge

MAIN LANDING GEAR



1 Fäll- och låsmekanism
2 Manövercylinder
3 Inåt huvudställ och lucka
4 Ben
5 Hopdragningsmekanism
6 Manövercylinder, yttre lucka
7 Yttre lucka
8 Huvudhjul
9 Inre lucka
10 Bromsledningar
11 Landställarreglage

Göran Henriksson



The nose gear well is located aft of the cockpit, just forward of the ram air turbine (RAT) storage compartment. The twin gear well doors are piano-hinged to the fuselage structure and opened and closed via mechanical linkage to the nose gear strut assembly. Gear limitation speeds also are applicable to the gear well doors. Uplocks, which automatically are applied when the nose gear is retracted, assure that inadvertent inflight door extension will not occur.

Göran Henriksson

Chris Pocock

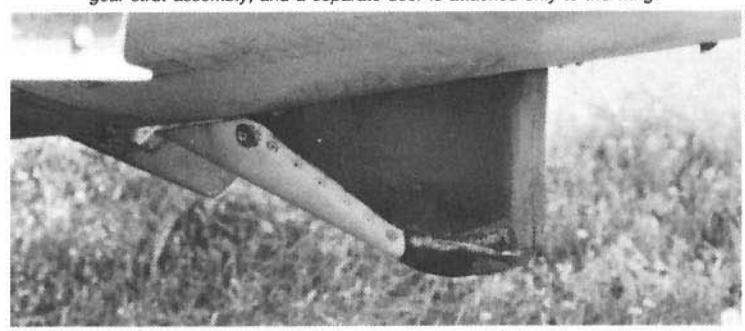
The outward retraction of the "Draken's" main landing gear is somewhat unconventional, though highly practical. It permits the transportation of a variety of centerline stores, including combinations of drop tanks, bombs, and rocket pods. Additionally, and perhaps most important, it keeps the gear tread dimensions within the limits dictated by the "Flygvapen's" requirements that the "Draken" be operable from conventional highways (usually about 33 feet wide).

Göran Henriksson collection

The main landing gear angles out slightly from the vertical. A single anti-torque link prevents axial rotation of the oleo strut. The "Draken's" landing gear permits taxi speeds of over 100 mph on back-country highways.

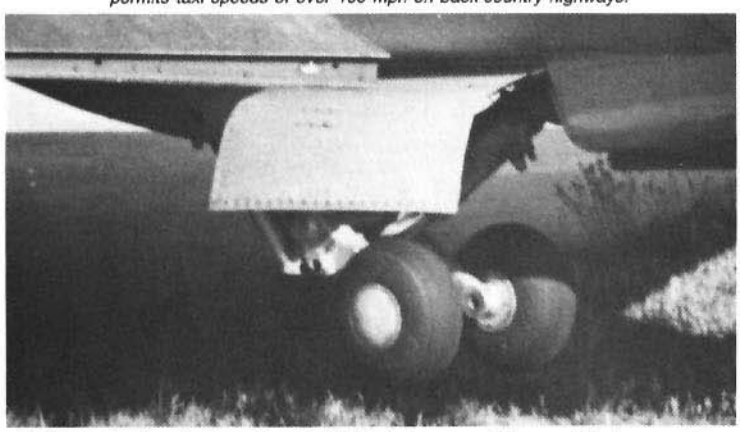
Göran Henriksson

The main gear well is located in the inner portion of the double delta wing. Two doors cover the well when the gear are retracted. One door is attached directly to the gear strut assembly, and a separate door is attached only to the wing.



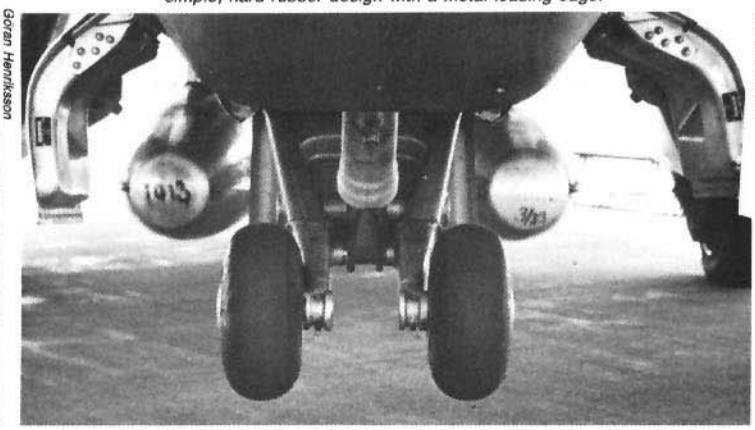
Göran Henriksson

Early models of the "Draken" had a tail bumper/skid assembly for over-rotation that was sufficient with the original, short tail cone. The bumper was a simple, hard rubber design with a metal leading edge.



Göran Henriksson

Following the introduction of the Model 66 afterburner and its associated empennage section extension, SAAB engineers elected to equip the aircraft with a small, dual wheel, non-steerable, retractable tail wheel assembly.

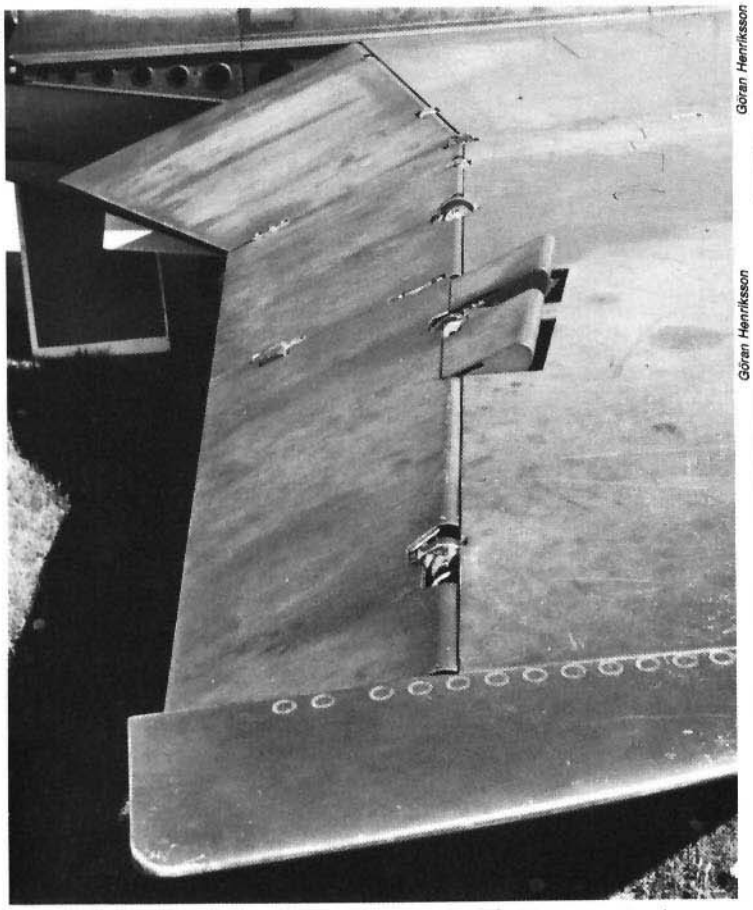


Göran Henriksson

Each tailwheel is supported by its own strut and cantilevered axle. The struts are joined by a cross bar, which in turn, is attached to a hydraulic actuator which serves as a shock strut and also to retract and extend the gear.

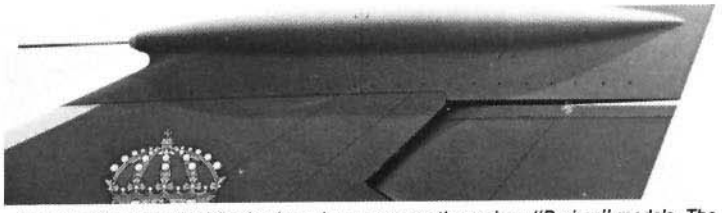
Göran Henriksson

The entire wing trailing edge, with the exception of a small segment near the wing root and another small segment at the wingtip, is control surface area. These hydraulically actuated surfaces are true elevons which provide both pitch and roll control. Symmetrical actuation provides pitch and asymmetrical actuation provides roll moments. A pair of mass balances is installed on the trailing edge of each outboard elevon segement.



Göran Henriksson

Because the hinge points for the elevons are not fitted in a straight line, the elevons are segmented to permit necessary angular movement. The mass balances, which are simply aerodynamically configured weights, are provided cut-outs for clearance.

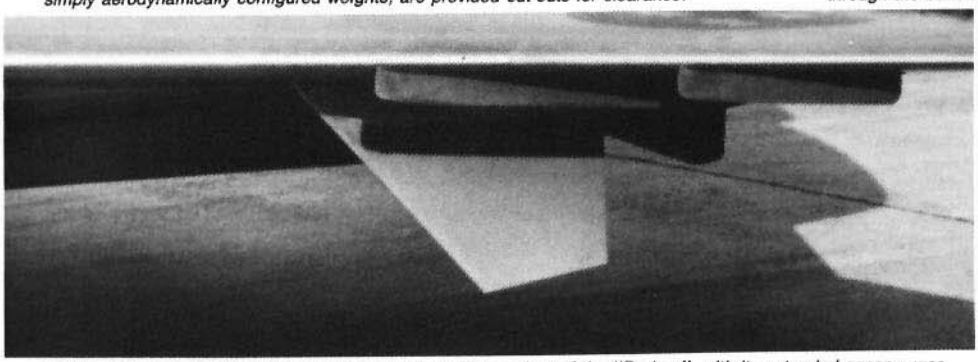


Göran Henriksson

Several different vertical fin tips have been seen on the various "Draken" models. The J35F tip, shown, has a faired bullet that accommodates a communications antenna and associated receiver modules. Other fairings are plain, with no bullet.

Göran Henriksson

The "Draken's" servo-assisted rudder is a single-piece unit with a large aerodynamic ballast segment at the top. Control inputs are routed from the rudder pedals through the booster unit, with no direct mechanical input from the pilot.



Göran Henriksson

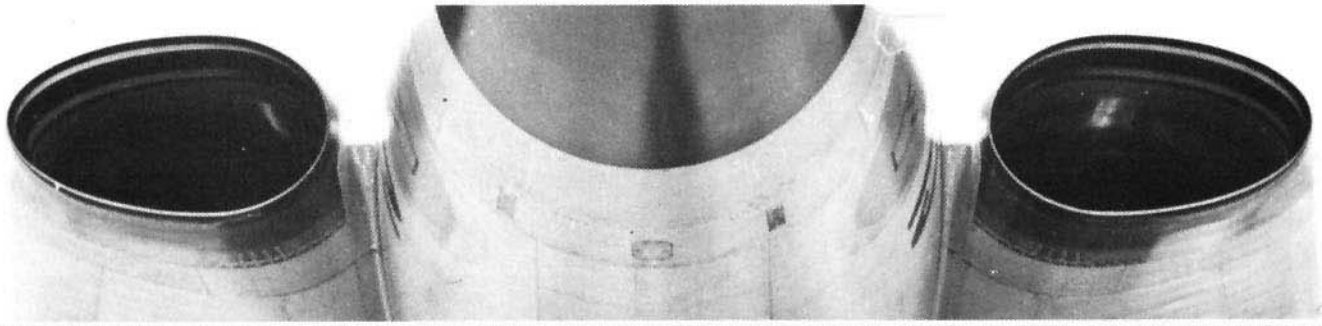
As originally flown, the Sk35C two-seat training/transition variant of the "Draken", with its extended canopy, was discovered to lack sufficient vertical surface area in certain parts of its flight envelope. Accordingly, two small fixed ventral fins were added under the wing, just aft of the main gear wells.

Göran Henriksson

"Draken" support requires a minimum of equipment. SAAB was specifically aware of field maintenance difficulties when the "Draken" was designed.

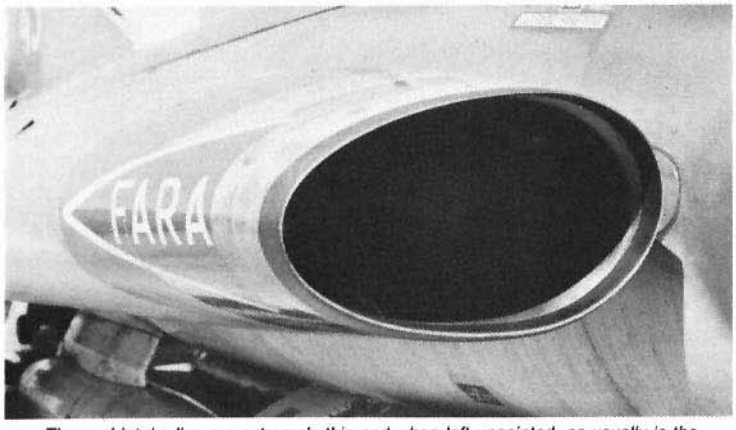
Göran Henriksson

The "Draken's" distinctive auxiliary dorsal fin serves basically the same function as a vertical fin root extension by increasing the surface area in relation to the aircraft yaw moments. The auxiliary fin is a fixed surface. On Danish F-35s, TF-35s, and RF-35s, the auxiliary fin has been removed—possibly in consideration of the internal redistribution of mass in Danish aircraft, or the effect of the forward Rb24 missile pylons underneath the forward inboard section of the double delta wing.



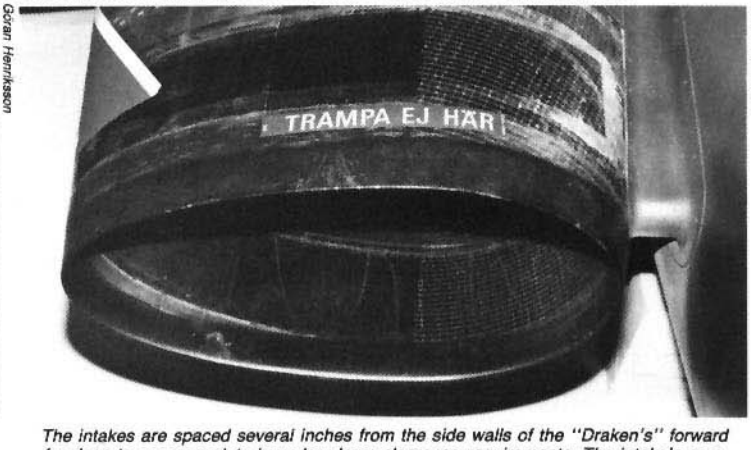
Göran Henriksson

The "Draken's" oval intakes are of unique design in that they are simple, yet functional out to speeds slightly in excess of Mach 2. Unlike most contemporary intakes optimized for relatively high Mach numbers, they have no moving parts, and thus are of the "fixed ramp" variety. Boundary layer bleed is simply accomplished by designing the intakes to clear the nose boundary layer flow. The intakes are of composite construction and are attached to the aluminum intake tunnels using flush rivets.



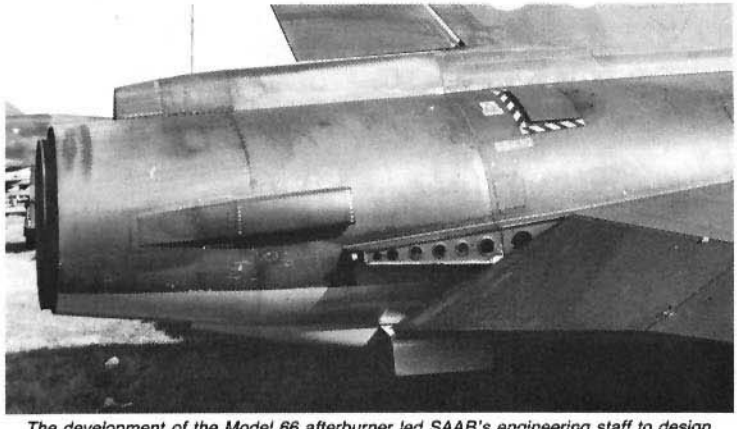
Göran Henriksson

The oval intake lips are extremely thin and when left unpainted, as usually is the case, are effectively transluscent. The intake tunnel has few bends and thus provides a very adequate air mass flow to the RM6 turbojet engine.



Göran Henriksson

The intakes are spaced several inches from the side walls of the "Draken's" forward fuselage to accommodate boundary layer clearance requirements. The intake's composite construction was several generations ahead of today's composite technology.



Göran Henriksson

The development of the Model 66 afterburner led SAAB's engineering staff to design an entirely new tailcone. This accommodated the new exhaust pipe and exhaust nozzle, but created problems with rotation during takeoff and landing.

SAAB via David Anderton

A variety of first-generation short tailcones are seen in this early photo of the J35 test aircraft line-up at SAAB's Linköping facility. The second and third aircraft from the rear have the original slanted tailcone fairings.

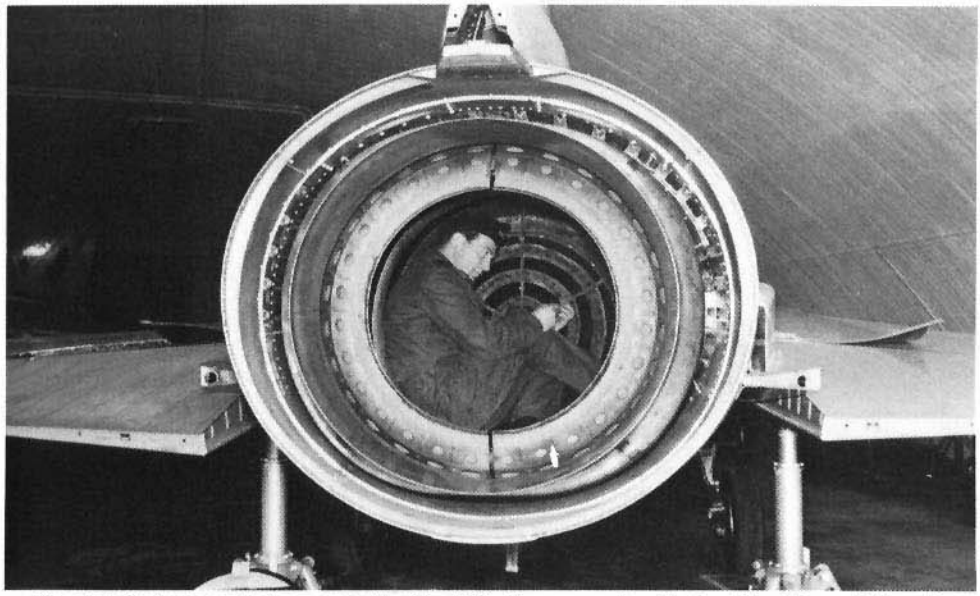
Göran Henriksson

The interim short tailcone of the original J35A. Intakes were mounted on either side of the tailcone to accommodate afterburner cooling requirements. A drag chute compartment was contained in the fairing at the base and trailing edge of the vertical fin.

Göran Henriksson

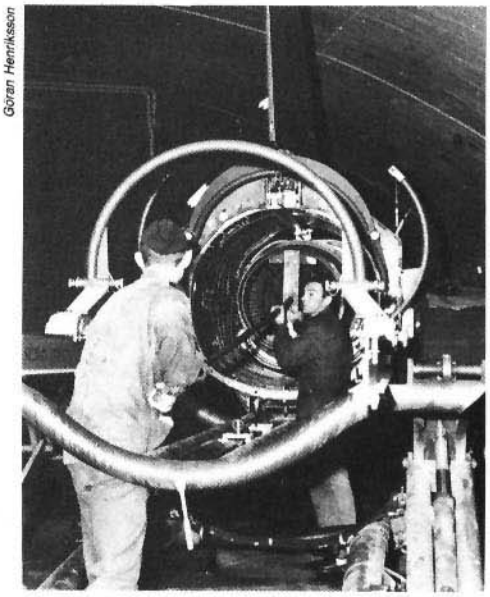
The long tailcone of the "Drakens" equipped with the late model afterburners. Due to rotational requirements of the aircraft during takeoff and landing, it was equipped with a tailwheel assembly when the new and longer tailcone was added.

Göran Henriksson collection



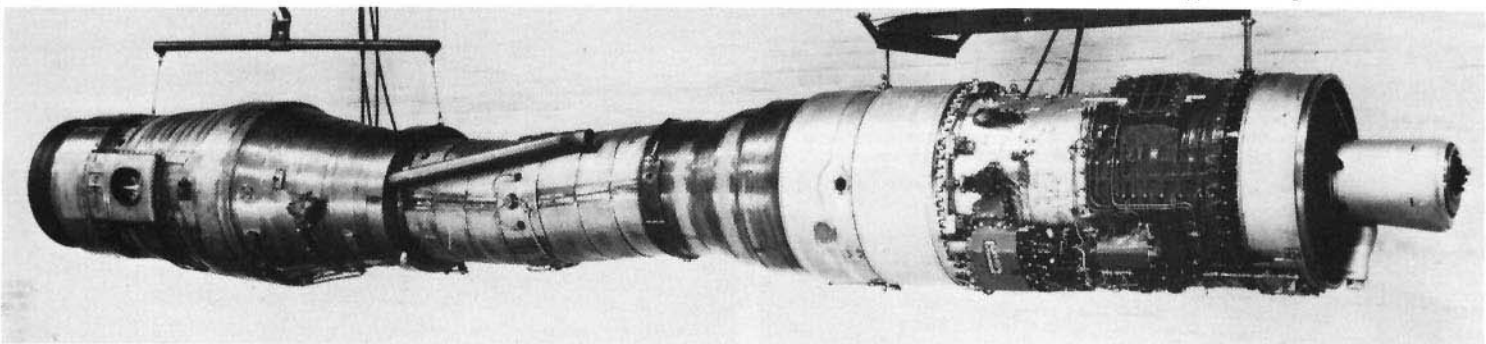
The short afterburner and tailcone assembly of the J35A. The cross-sectional design of the tailcone at this point was slightly oval, though the engine exhaust nozzle was almost perfectly round. The exhaust nozzle was of the vertical split eyelid type.

Göran Henriksson

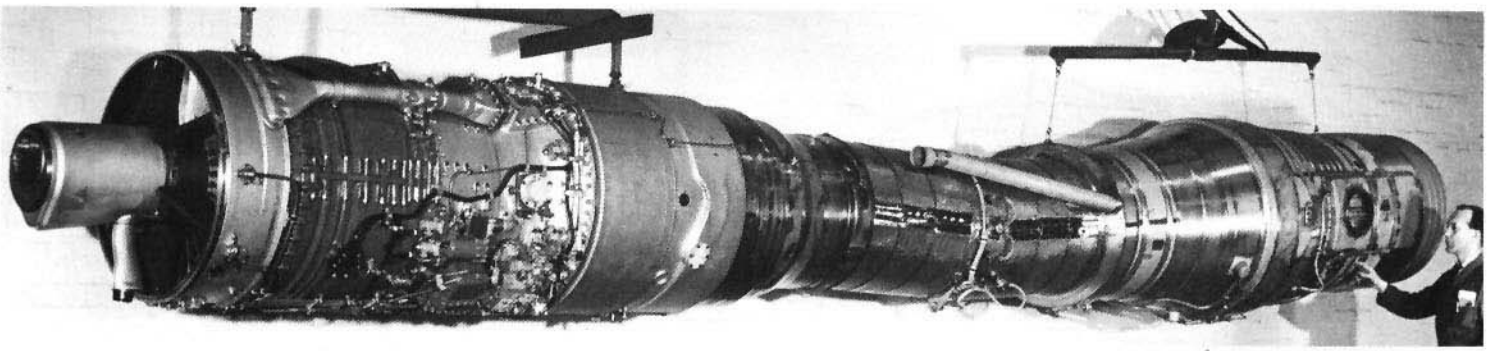


The "Draken's" engine is removed and installed easily. A structural keel, visible in the engine compartment, serves to support it during maintenance.

Volvo Flygmotor AB

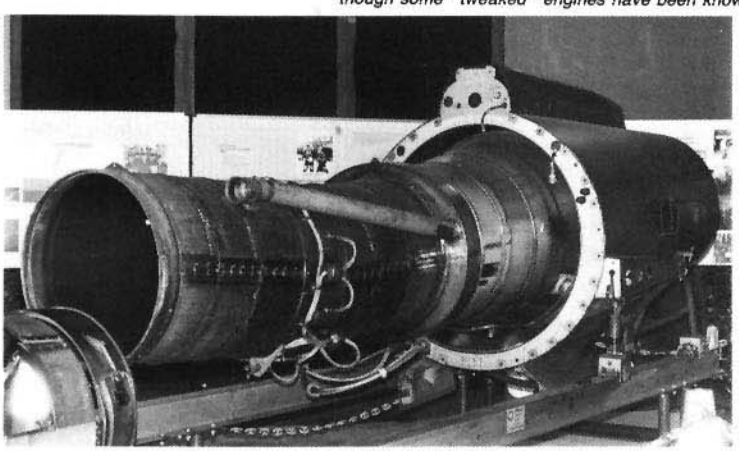


Volvo Flygmotor AB



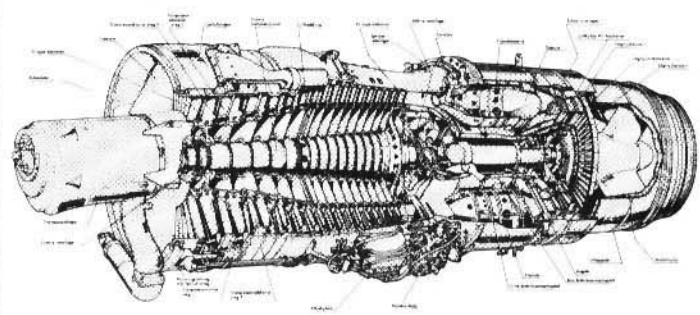
The Volvo Flygmotor AB RM6C is a developed version of the British Rolls Royce "Avon"-300, built under license. It is somewhat unusual in having an extended exhaust and an angled afterburner. The latter is due to thrust line requirements dictated by drag and performance specifications. Thrust with afterburner is over 17,000 lbs., though some "tweaked" engines have been known to develop over 18,000 lbs. during static testing.

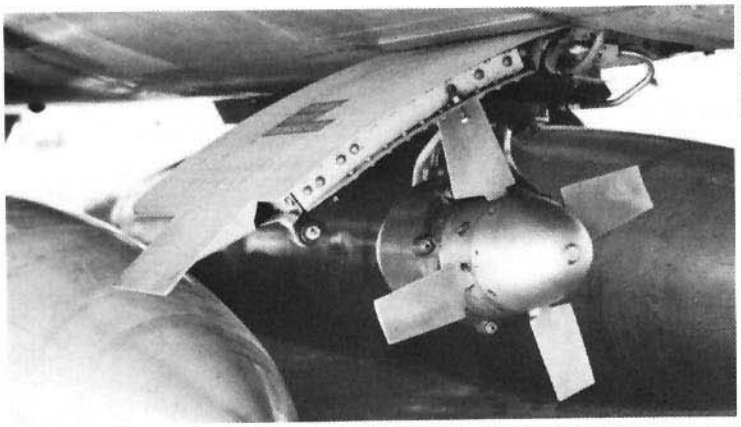
Chris Pocock



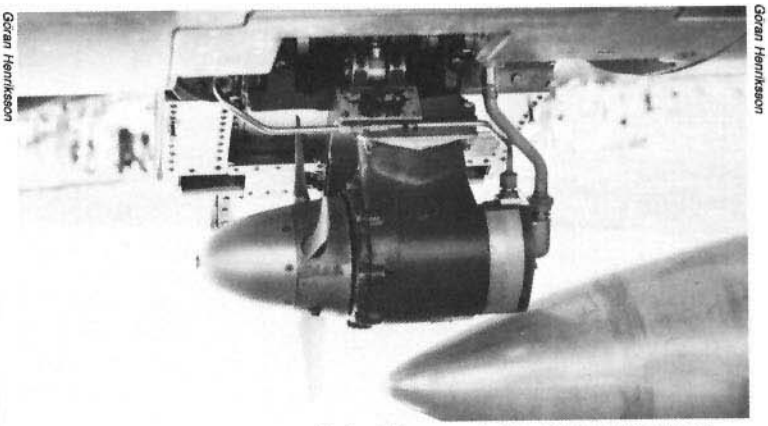
The RM6C exhaust pipe and afterburner are integral with the empennage and tail cone assembly. Cooling air ducting and fuel lines are visible, along with the vertical fin base fairing assembly. Noteworthy is the pipe insulation blanket.

SVENSKA FLYGMOTOR RM6C



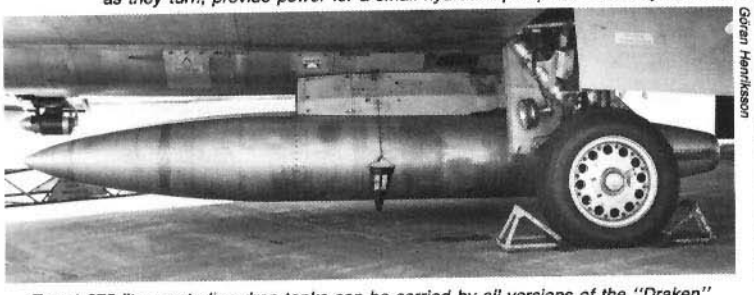


Göran Henriksson



Göran Henriksson

"Drakens" are equipped with a small ram air turbine (RAT) that deploys automatically during an emergency and also automatically at the moment of touchdown in the aircraft. This unit supplies emergency hydraulic power during powerplant failures. Power is supplied by free air passing through the small variable pitch propeller blades which, as they turn, provide power for a small hydraulic pump. Sufficient hydraulic energy is generated to permit control of the aircraft as long as it remains airborne.

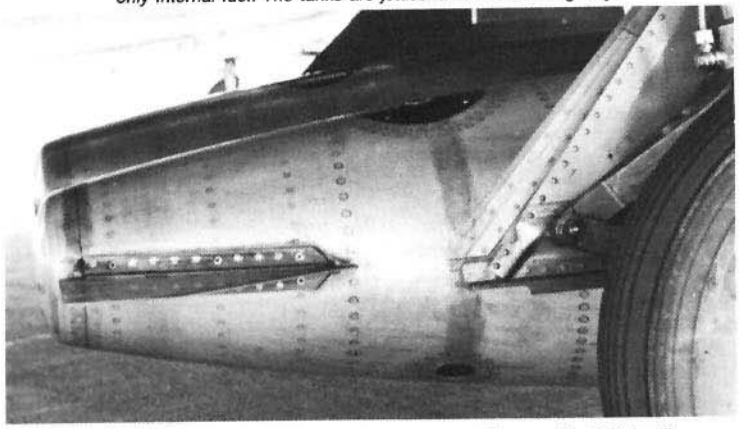


Göran Henriksson

Two 1,275 liter centerline drop tanks can be carried by all versions of the "Draken" to provide a considerable range extension over what normally is available using only internal fuel. The tanks are jettisonable in an emergency.

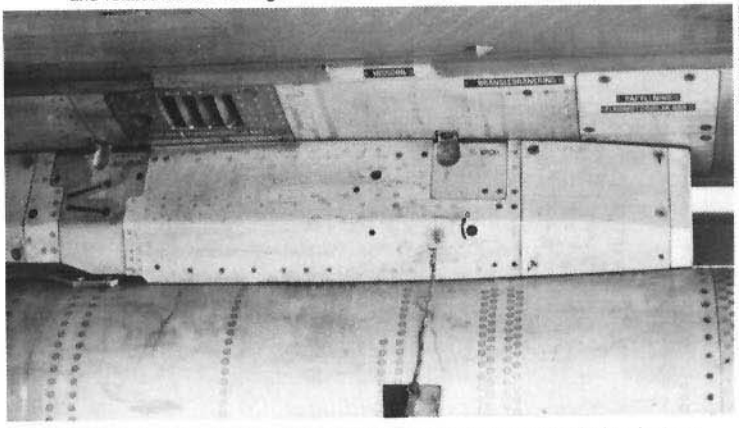
Göran Henriksson

The tanks, when used in pairs, usually are attached to the "Draken" using a T52 pylon. This pylon can be used to carry missile pods, reconnaissance pods, and related items. Tank ground clearances, as can be seen, are minimal.



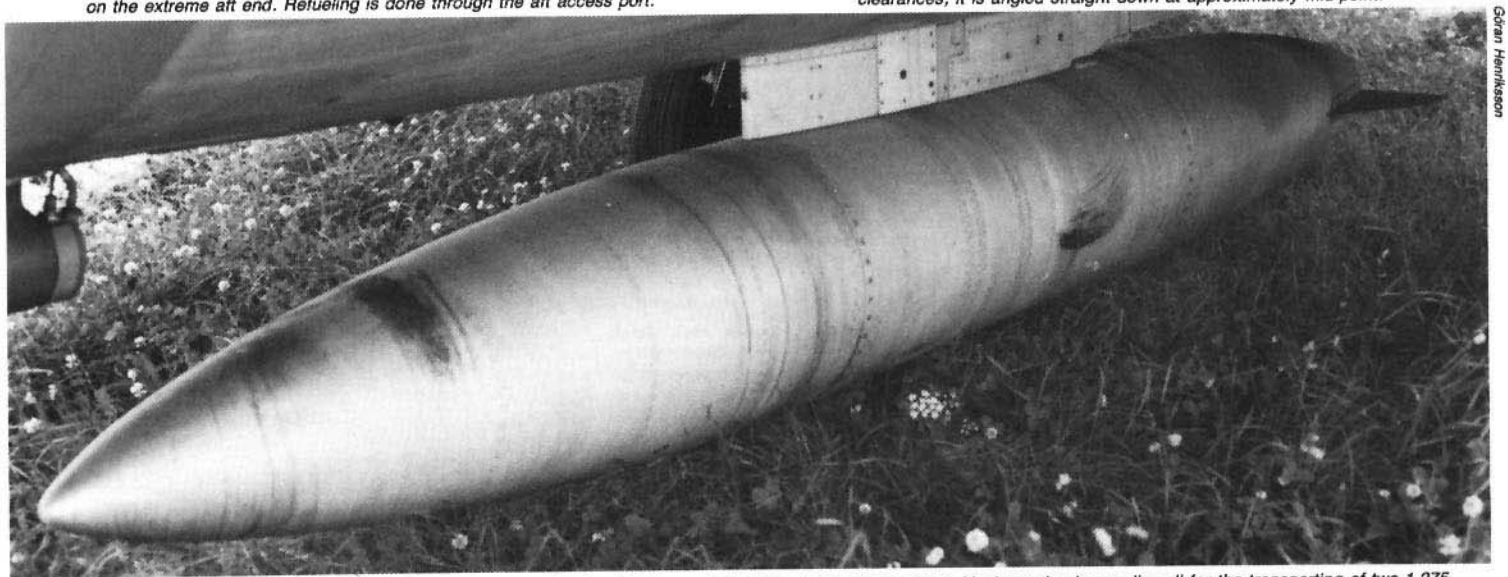
Göran Henriksson

The aft end of the 1,275 liter tank is effectively blunt. Two small stabilizing fins, designed to provide stability during the jettisoning process, are mounted on the extreme aft end. Refueling is done through the aft access port.



Göran Henriksson

The T52 pylon is designed to intersect both the fuselage and the fuel tank at an effective 90° angle. In order to do this, and allow necessary main landing gear clearances, it is angled straight down at approximately mid-point.

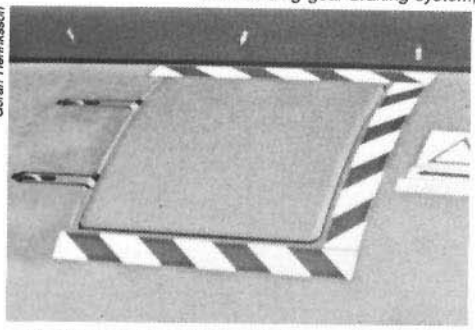


Göran Henriksson

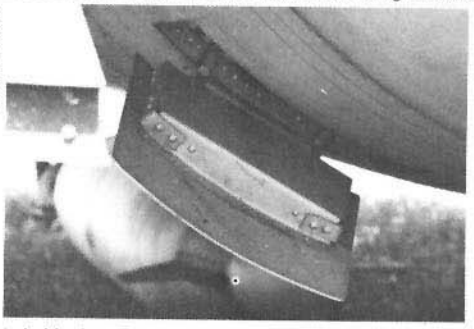
The "Draken" is fully capable of flying supersonically with either the 500 liter or 1,275 liter drop tanks in place. Maximum loads usually call for the transporting of two 1,275 liter tanks and two 500 liter tanks, with the former mounted on the aircraft centerline, and the latter on the aircraft wing outer pylons. Fuel is transferred from the tanks to the powerplant through plumbing installed in the pylons. Aerodynamic jettisoning is possible, with the tanks free-falling upon pilot command.

Göran Henriksson

The "Draken" is equipped with a large, all-nylon, ribbon-type drag chute that is housed in a compartment aft of the base of the rudder. It is very effective in shortening the aircraft's landing roll-out and can be jettisoned after use. Combined with the "Draken's" innate aerodynamic drag during a nose-high landing roll-out, its effective main landing gear braking system, and the small aft-fuselage-mounted airbrakes, landing rolls shorter than 2,000 feet are commonplace.

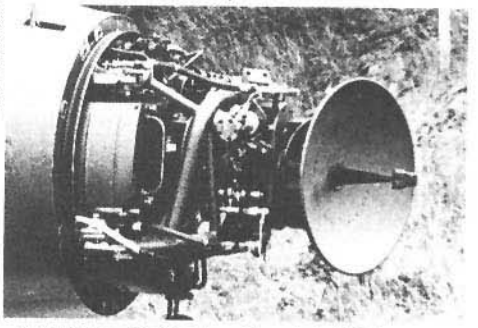


Göran Henriksson



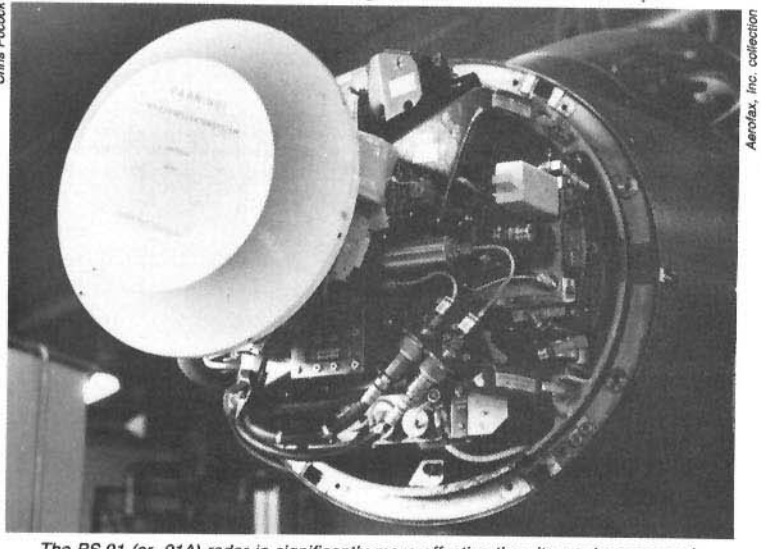
Göran Henriksson

The "Draken" is equipped with four small hydraulically-actuated airbrakes. Two are mounted above the wing trailing edge and two are mounted below, on the fuselage empennage section. These can be utilized throughout most of the aircraft's envelope.



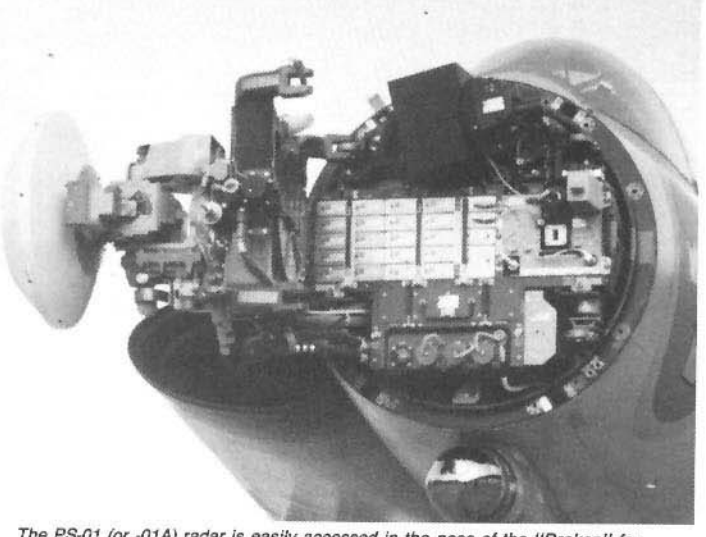
Göran Henriksson

The Ericsson PS-03 radar of the original J35A was an only modestly effective unit with limited range and virtually no protection against electronic countermeasures.



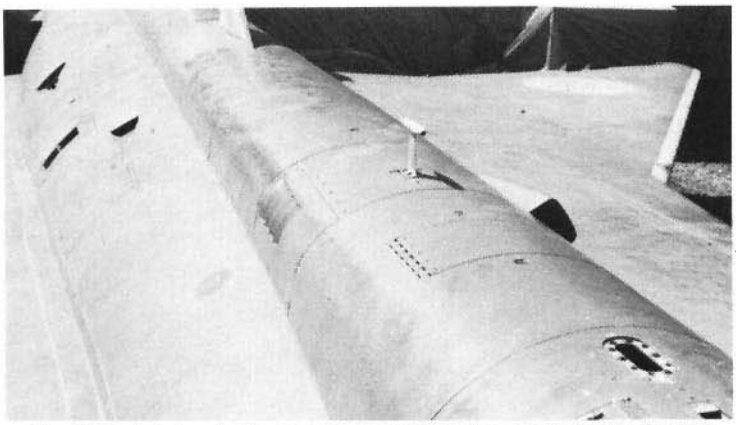
Chris Pocock

The PS-01 (or -01A) radar is significantly more effective than its predecessor and has greater range and greater resistance to countermeasures. It equips the J35F series "Drakens" and has been utilized on other versions, as well.



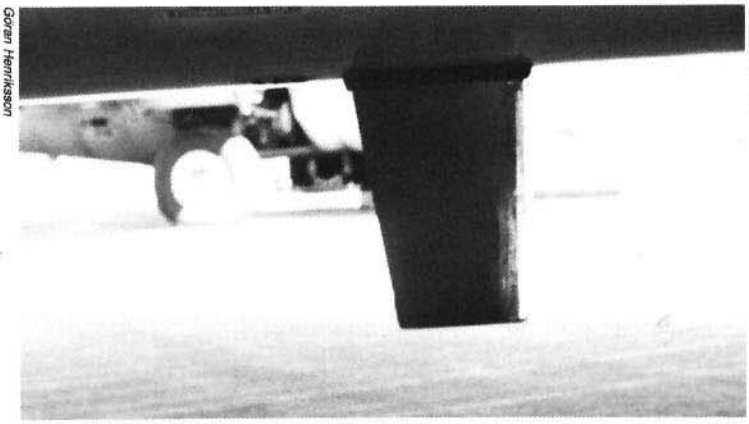
Aerofax, inc. collection

The PS-01 (or -01A) radar is easily accessed in the nose of the "Draken" for maintenance. Like most tracking/scanning radars, the dish section is mechanically articulated and moves in both the vertical and horizontal axis.



Göran Henriksson

The "Draken's" dorsal spine serves as a conduit for various control cables, several avionics bays, and a variety of hoses, electrical lines, and tubes. It is equipped with several small, hinged access doors which permit maintenance of internal systems.

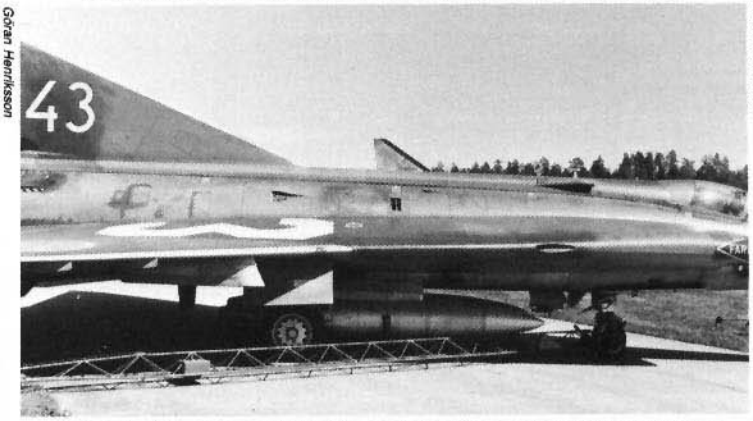


Göran Henriksson

A single communications antenna is mounted underneath the mid-fuselage point, just to the rear of the centerline drop tanks. This area of the aircraft is built as a single, integral unit and structurally is one of the strongest airframe components.

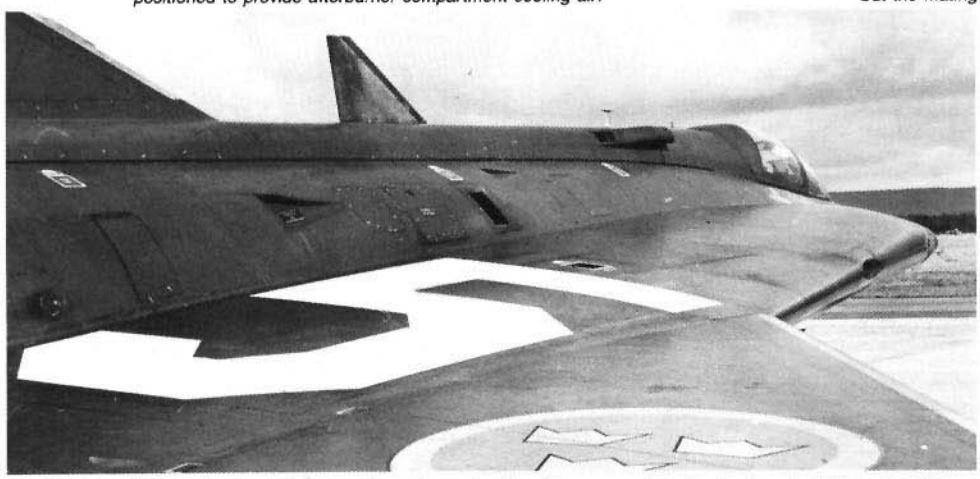
Göran Henriksson

The vertical fin is a cantilever structure attached directly to the empennage section of the fuselage and faired at its base. A single low drag NACA duct is positioned to provide afterburner compartment cooling air.



Göran Henriksson

The "Draken" is not area ruled in the conventional sense, though its configuration provides an effective area rule affect. The wing and fuselage are not blended, but the mating of the two is clean and aerodynamically efficient.

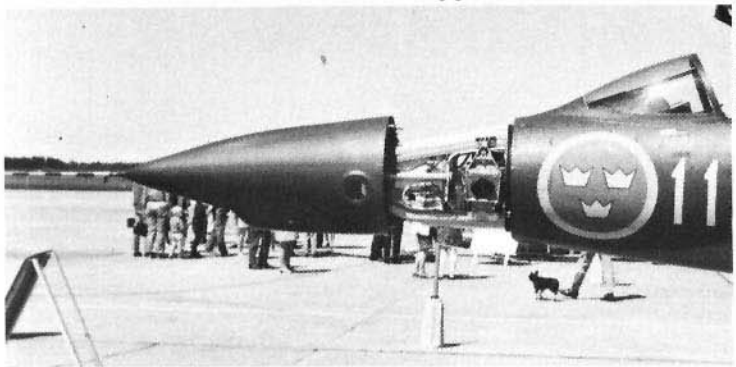


Göran Henriksson

The forward (inboard) wing surface area is much greater than it appears when viewing the aircraft from the side. Its thickness also is sufficient to provide room for internal ducting, the gun bays, the main landing gear wells, and fuel tanks.

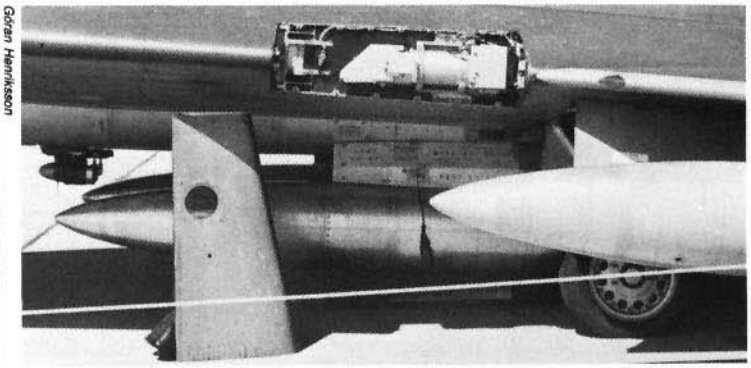
SAAB

The S35E photo-reconnaissance "Draken" is equipped with nose- and wing-mounted optical sensor bays with glass portals to accommodate cameras.



Göran Henriksson

The S35E's nose fairing slides forward on rails to permit access to the nose camera bay. Several different French "Omera" reconnaissance cameras can be carried in this compartment, these each being equipped with lenses of differing focal length.



Göran Henriksson

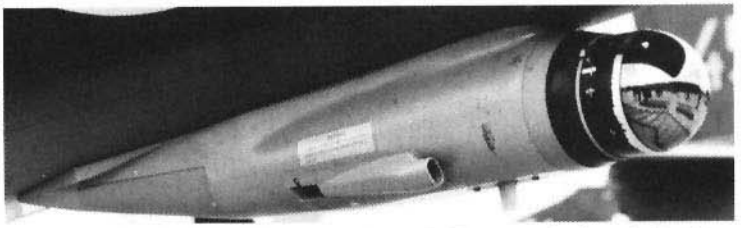
An "Omera" camera also is mounted in each of the S35E's two wing camera bays. These are accessed by removing a special leading edge wing panel that is equipped with a viewing port. The lens is mirror-equipped to permit right-angle viewing.

Goran Henriksson collection

The S35E is an excellent reconnaissance system platform due to the innate low-level ride characteristics of its double delta wing. The "Omera" cameras and their high-resolution lenses are ideal for low- and medium-altitude reconnaissance.

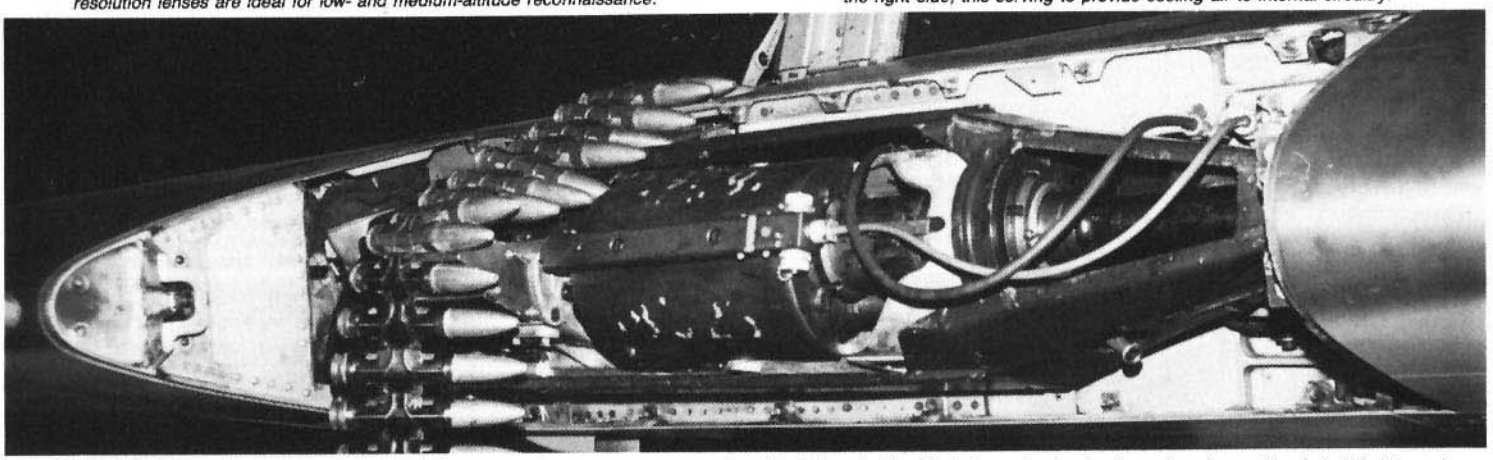
Göran Henriksson

The first "Draken" variant to be equipped with an infrared sensor was the J35A. Rectangular in cross section, it had limited range and effectivity. As can be seen, it differed considerably from the more advanced, ball-type system found on J35F²s.



Göran Henriksson

The Hughes-developed infrared sensor for the J35F². This cryogenically-cooled tracking unit has a range of approximately sixteen miles. An auxiliary intake is visible on the right side, this serving to provide cooling air to internal circuitry.



Chris Pocock

The two Aden 30mm M/55 cannon are mounted in separate wing compartments and are fired through faired holes in each wing leading edge. Ammunition is belt fed to each gun from storage compartments inboard of each gun bay. Panels are removed on the upper surface of the inboard wing sections allowing access to the storage compartments for loading. Due to placement of the guns and their ammunition, as the latter is expended, there is no shift in aircraft center of gravity.

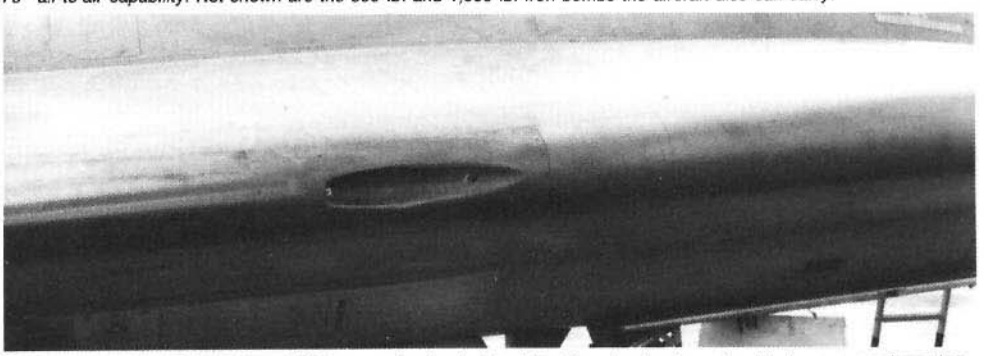
Göran Henriksson

Göran Henriksson

The "Draken", in its different versions, is capable of carrying a wide variety of externally mounted stores. Included in this display are 30mm cannon rounds, 75mm Bofors air-to-air rockets and their associated pods (both faired and unfaired), and 135mm Bofors air-to-ground rockets. Rb24, Rb27, and Rb28 air-to-air missiles are perhaps the most important components of the "Draken's" air-to-air capability. Not shown are the 500 lb. and 1,000 lb. iron bombs the aircraft also can carry.

Göran Henriksson

The 75mm Bofors rocket pods (right) are similar in size and configuration to the 1,275 liter external drop tank. Their nose fairings are frangible plastic.

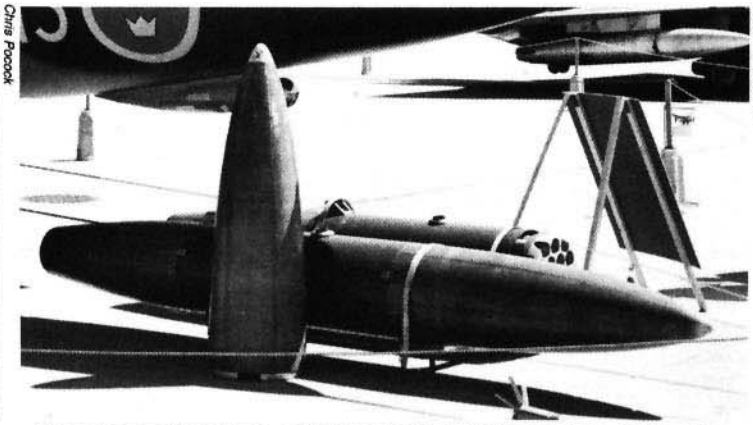


Göran Henriksson

The gun port for the Aden 30mm M/55 cannon is cleanly faired into the wing leading edge. Engine gun gas ingestion problems are non-existent due to the gun port location. The wing location also makes the gun bays readily accessible to ground crews while providing a rigid and easily bore-sighted gun mounting point.

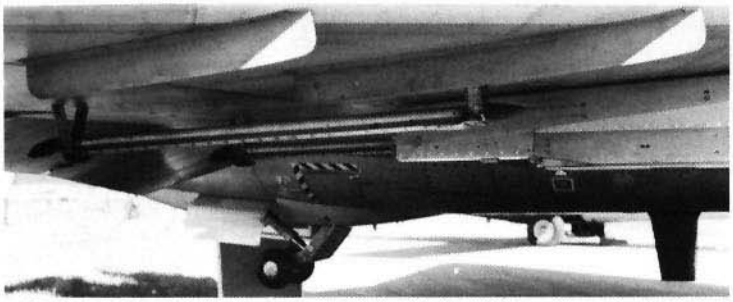
Chris Pocock

The 75mm Bofors folding fin air-to-air rockets and their associated pods usually are hung from the centerline mounting points. Nineteen rockets can be carried in each pod. The rockets are unguided and fin-stabilized.



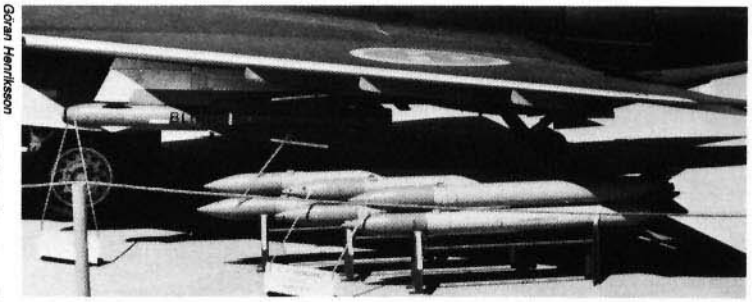
Göran Henriksson

The pods are quite similar in configuration to the 1,275 liter drop tank. As the rockets leave their separate tubes they penetrate the frangible plastic nose of the pod, which disintegrates, and then accelerate on to their target.



Göran Henriksson

The large Bofors 135mm air-to-surface rockets are individually rail launched, though as many as two can be piggy-backed onto a single rail system. Like the 75mm rocket, the 135mm weapons are fin-stabilized and unguided.

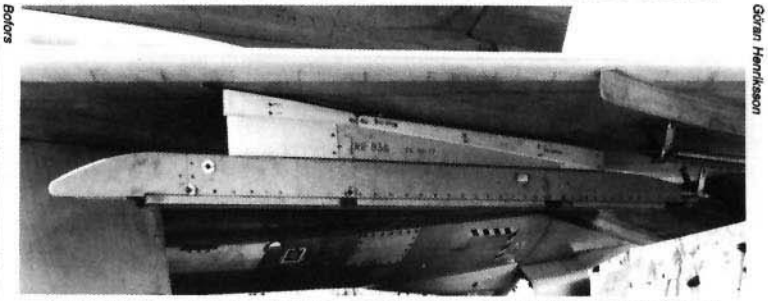


Göran Henriksson

The Bofors 135mm rocket has a large warhead which effectively makes up the forward 25% of the weapon. The rest of the tube consists of solid-fuel propellant which is ignited electrically upon pilot command. The suspension pylon utilized is called A5.

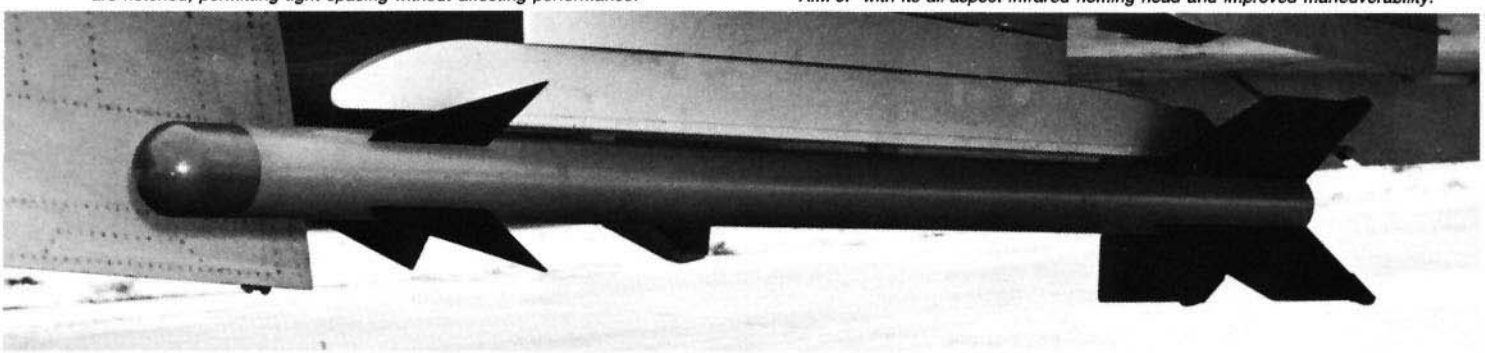
Bofors

Dummy Bofors 135mm rockets provide insight into the piggy-back mounting method employed to increase the loading capacity of the individual rails. The fixed fins are notched, permitting tight spacing without affecting performance.



Göran Henriksson

A special rail has been designed to accommodate the Rb24 "Sidewinder" air-to-air missile. The latest variant of the Rb24 is equivalent approximately to the American AIM-9P with its all-aspect infrared homing head and improved maneuverability.

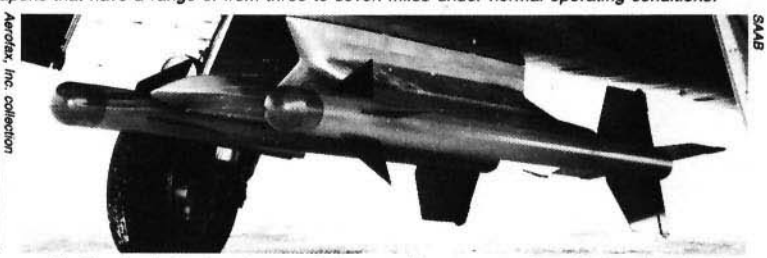


SAAB

Various models of the American "Sidewinder" missile, originally developed by the Navy and what is now Ford Aerospace, have been manufactured in Sweden and used to equip the different versions of the "Draken". An aerodynamic dummy model of a very early AIM-9B, or its equivalent, is shown suspended from the wing of one of the original "Draken" prototypes. The AIM-9, and its Rb24 equivalent, are heat-seeking (infrared homing) weapons that have a range of from three to seven miles under normal operating conditions.

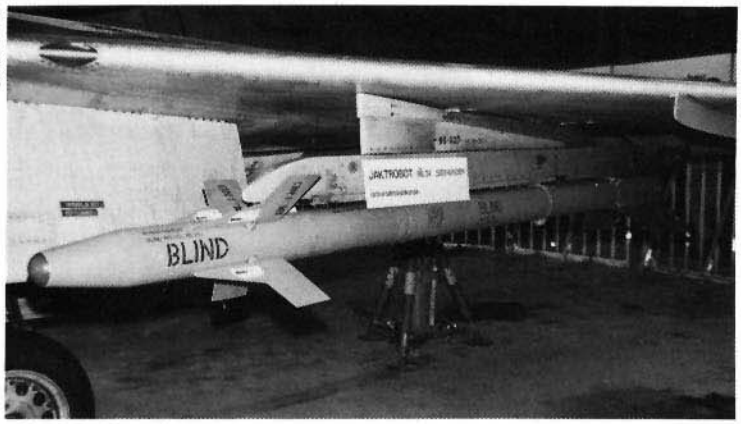
Aerofax, Inc. collection

Mounting the Rb24 easily can be accomplished in the field. On early "Drakens" only four Rb24s could be carried. Late versions are equipped to carry as many as six. Usually, Rb24s are combined with Rb27s and Rb28s to give a variable capability.



SAAB

The Y pylon is designed to permit the centerline transport of two Rb24s. Additional weapons can be carried on wing pylons. Dummy Rb24s, used to verify the aerodynamic compatibility of the weapon when attached to the "Draken", are shown.

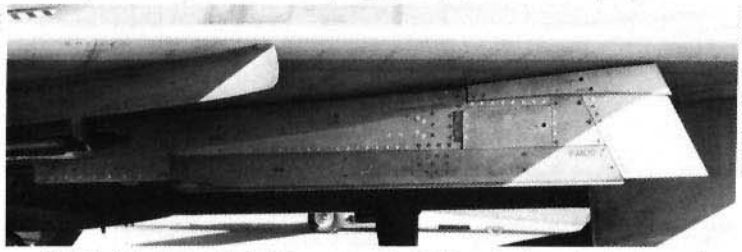


Chris Pocock

The Rb24J is equivalent ot the American AIM-9J and appears to have a similar seeker head and aerodynamic shell. The control system is located in the nose, the warhead is just aft of the canard fin trailing edges, and propellant fills everything aft.

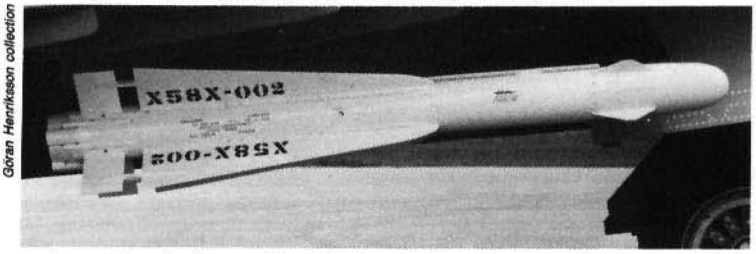
Göran Henriksson

The J35J testbed, a J35F², is seen with the aerodynamic dummy of an Rb24J suspended from its new inboard wing pylon. Attached to the centerline stores pylon is a special photo pod for documenting air-to-air missile launches.



Göran Henriksson

The F5 wing pylon optimized for carrying the Rb27 semi-active radar homing and Rb28 infrared homing air-to-air missiles. Due to the size and weight of these weapons, the pylon assembly must be of fairly robust construction.



Göran Henriksson collection

An aerodynamic dummy of the Rb28 air-to-air missile. This weapon was developed from the original Hughes AIM-4-series "Falcon". With a probability-of-kill record of less than .25, the latter's performance in Vietnam proved very disappointing.

Chris Pocock

A dummy Rb28 suspended from an F5 pylon. The white strips on the rear fins are detonators designed to set off the missile's warhead in a near-miss.

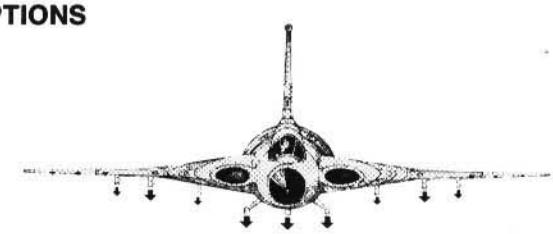
Göran Henriksson

A dummy Rb27 suspended from a wing-mounted F-5 pylon. Strips on the fins were designed to cause warhead detonation when a target was grazed.

Chris Pocock

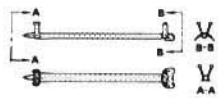
Another view of a dummy ("Blind") Rb27 air-to-air missile suspended from a wing-mounted F-5 pylon. The Rb27's homing head is of the semi-active radar type.

PYLON OPTIONS

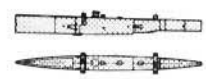


Internal fuel only	1000 lb bombs	
	500 lb bombs	
	Rocket pods	
Two 1275-litre drop tanks	1000 lb bombs	
	500 lb bombs	
	Rocket pods	
	Missiles air-to-ground	
	Rockets air-to-ground	
Four drop tanks (1275 + 500)	1000 lb bombs	
	500 lb bombs	

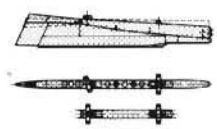
HARDPOINTS AND PYLONS



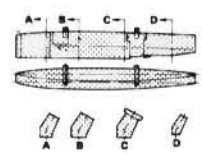
PYLON A5



PYLON T51

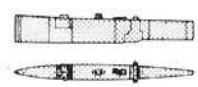


PYLON F5



PYLON T52

PYLON J5



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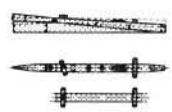
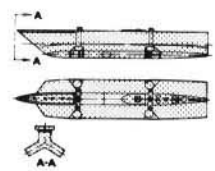
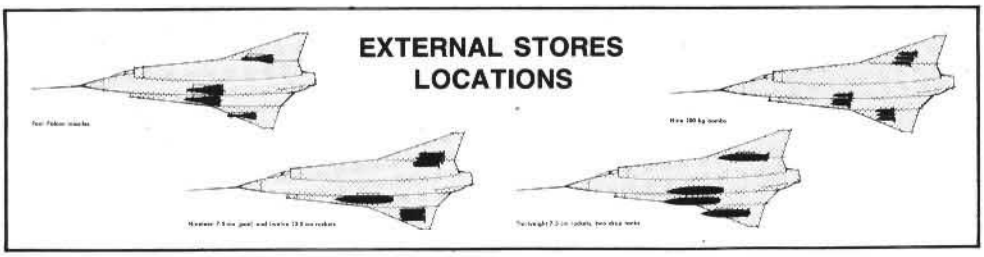


PYLON S5

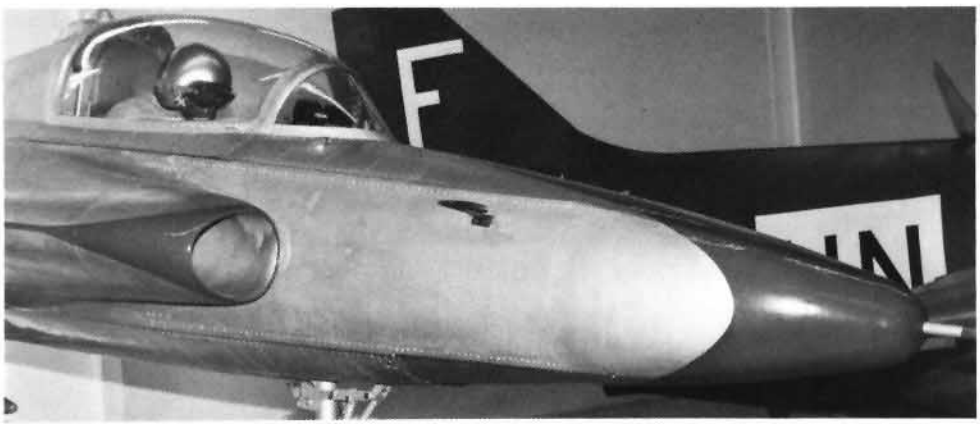


PYLON Y



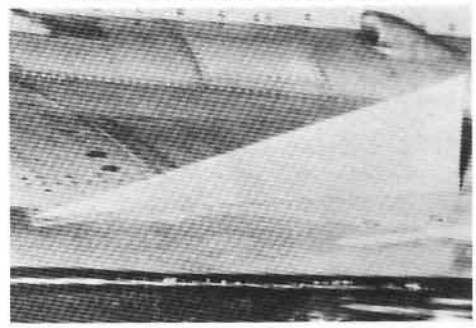
Göran Henriksson

A special wing-mounted camera pod for photographing test launches of Rb24, Rb27, and Rb28 air-to-air missiles from an early "Draken" variant.



Göran Henriksson

The SAAB 210 "Lill-Draken" currently is on display indoors at the Swedish Air Force Museum at Malmslatt. The similarity between the final SAAB 210 nose configuration, with its split, oval intakes, and that which appeared on the production "Draken" fighter, is apparent. Over 1,000 test hops were successfully undertaken by this testbed.

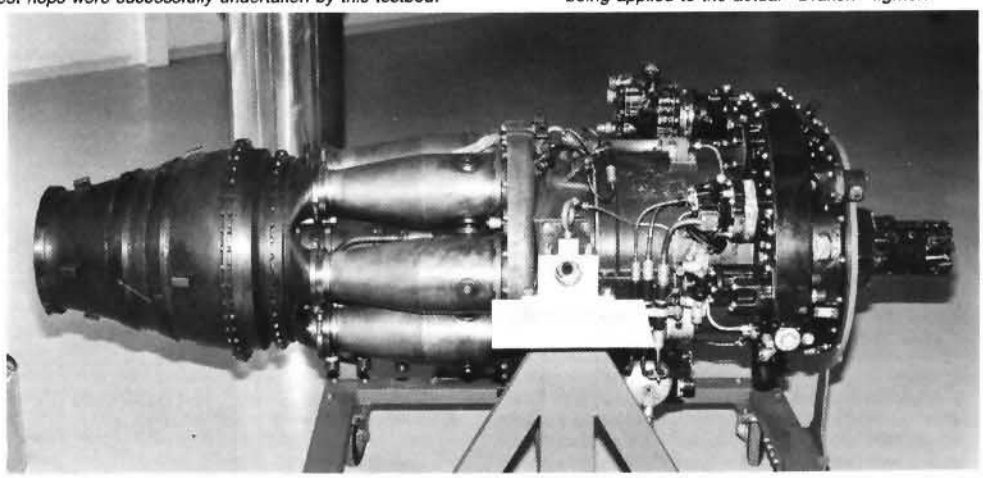


SAAB

Many aerodynamic components, such as this triangular wing fence, were tested on the SAAB 210 before being applied to the actual "Draken" fighter.

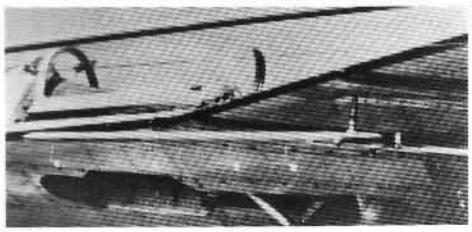
Göran Henriksson

The SAAB 210 had simple, forward retracting main landing gear. The gear remained exposed to the slipstream, as there were no gear well doors.



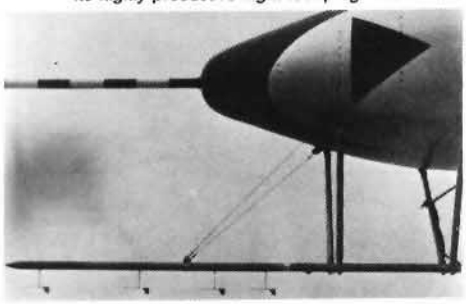
Göran Henriksson

The SAAB 210 was powered by a single Armstrong-Siddeley "Adder" turbojet engine rated at 1,000 lbs. th. static. Unfortunately, this was only marginally enough power to get the aircraft into the air, and performance was very limited. On the positive side, the "Adder" was found to be relatively dependable and trouble free.



SAAB

A variety of pitot tubes and other appendages were attached to the SAAB 210 during the course of its highly productive flight test program.



SAAB

Test system pitot tubes, designed to record pitch and yaw anomalies at varying angles of attack and airspeeds, were attached to the nose and wings.

Chris Pocock

Late model pilot flight gear for the "Draken" is less cumbersome than earlier clothing. The pilot on the left is wearing a survival vest with flotation gear.

Aerofax, Inc. collection

Pilot flight gear for early "Drakens" and their respective first-generation ejection seats included a back-pack-type parachute and a seat-pack type survival kit.

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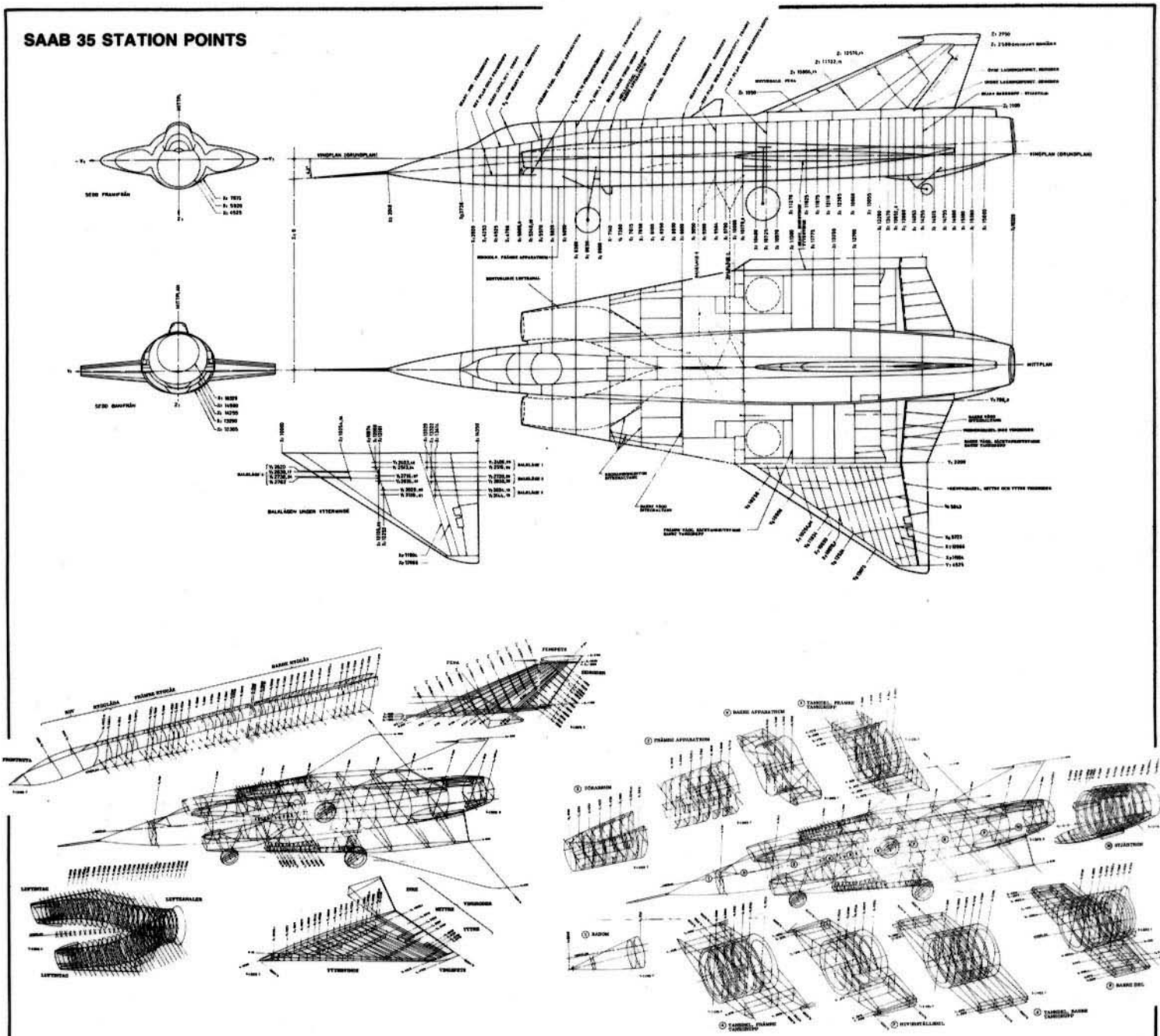
SAAB 35 STATION POINTS